World Blindness and its Prevention

VOLUME 4

Edited by
CARL KUPFER, M.D.
and
TERRENCE GILLEN, M.A., M.B.A.

INTERNATIONAL AGENCY FOR THE
PREVENTION OF BLINDNESS

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INTERNATIONAL AGENCY FOR THE
PREVENTION OF BLINDNESS

At least 80 percent of all cases of blindness in the world can be considered avoidable—that is, they could have been prevented or they could be cured by using available and locally appropriate technology. The International Agency for the Prevention of Blindness (IAPB), with its national and international partners, seeks to reduce global blindness by increasing awareness of this problem among the people of the world and their governments, by encouraging financial and manpower support of blindness prevention programs worldwide, and by promoting the development of successful prevention programs that employ locally appropriate and cost-effective technology.

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Preface

The Fourth General Assembly of the IAPB was held in Nairobi, Kenya, 11–16 November 1990. More than 400 ophthalmologists, public health workers, managers, and others in the prevention of blindness field traveled from over 70 countries to the Kenyatta International Conference Centre. National prevention of blindness committees from 60 countries were represented by 113 people at the Business Meeting. In addition, over a dozen non-governmental organizations and private corporations staffed booths that displayed their services and products.

The theme of the meeting, "Sustainable Strategies—Agenda for the 1990s", was discussed at the six plenary sessions and four workshop sessions by 86 designated speakers and panelists, plus scores of participants who took the opportunity to discuss their experiences at one of the open microphones. The contingent from Francophone Africa was provided with simultaneous translation at all plenary sessions, and several workshops were held in French.

Speakers at the opening ceremony included Hon. Mwai Kibaki, Kenyan Minister of Health, who delivered the Inaugural Address, and Dr. Bjorn Thylefors, Manager of the WHO Prevention of Blindness Program, who delivered the Keynote Address.

During this five-day meeting, the following subjects were discussed at the plenary sessions: national programs in Africa, regional progress reports, sustainable manpower development for blindness prevention, new developments in the control of major causes of blindness, and sustainable national program development. The workshop topics included: manpower development, delivery of specific eye-care services, major challenges and priorities for the delivery of eye-care services, and essential characteristics of a model self-sustaining prevention of blindness program, including partners such as private industry, NGOs, and WHO. In addition, seven IAPB Awards for Lifelong Service to the Prevention of Blindness were presented.

At the Business Meeting on the last day of the Assembly, Mr. Alan W. Johns, Executive Director of Sight Savers, was elected the new IAPB President and Dr. R. Pararajasegaram became the Agency's new Senior Vice President and President-Elect.

Major support for this General Assembly included grants from: Alcon Foundation; Allergan International; Chibret International (Ophthalmic Group of Merck Sharp & Dohme); Senju Pharmaceutical Co., Ltd.; and Task Force "Sight and Life" (supported by F. Hoffmann-La Roche and Co.). We are very grateful to them for their sponsorship of this Assembly.

This book of proceedings presents the most salient materials presented at the Fourth General Assembly.

— *Carl Kupfer, M.D.*
Immediate Past President, IAPB
Bethesda, Maryland

President's Message

The International Agency for the Prevention of Blindness (IAPB) was founded in 1975 to foster universal cooperation against avoidable blindness. Because the majority of cases of blindness worldwide are either curable or could have been avoided, the principal goal of the IAPB has been to control the four major diseases that cause more than two thirds of the blindness in the developing world: cataract, trachoma, xerophthalmia, and onchocerciasis. For the past 15 years throughout the world, this consortium of non-governmental organizations, national committees, and the World Health Organization has helped increase public awareness, utilize resources, and support sight-conservation programs through the implementation of the World Health Organization's health-care strategies.

The theme of this Fourth IAPB General Assembly is "Sustainable Strategies—Agenda for the 1990s." I therefore urge you as a participant in this Assembly here in Nairobi to help us develop new and better ways to increase and sustain the mobilization of resources necessary to terminate needless blindness worldwide. During this week, it is crucial for us to harness the expertise of the 400 ophthalmologists, eye-care providers, public health specialists, and managers engaged in the fight against avoidable blindness. We must listen to the first-hand experiences of the representatives from ministries of health, national committees for the prevention of blindness, the World Health Organization, and the major non-governmental organizations.

Because this Fourth General Assembly presents each of us with the opportunity to reexamine our successes, identify the obstacles that have to be overcome, and establish new goals, please communicate the lessons you have learned from your own prevention of blindness programs and, by sharing them, intensify the perseverance of all of us to continue in the battle against avoidable blindness.

—Carl Kupfer, M.D.

Welcome Message

On behalf of the people of the Republic of Kenya, the Ministry of Health, and on my own behalf, I hereby extend a warm welcome to all the participants of the Fourth General Assembly of the International Agency for the Prevention of Blindness in Nairobi from 11–16 November 1990. I wish you all a pleasant stay in Kenya and happy memories of the conference in Nairobi.

—*Dr. A.K. Gikonyo*
Chairman, Prevention of Blindness Committee
Senior Deputy Director of Medical Services
Ministry of Health, Nairobi, Kenya

PART 1

Opening Ceremony

WORLD BLINDNESS AND
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VOLUME 4

1

Opening Remarks

Dr. Carl Kupfer
Director, National Eye Institute
President, International Agency for the Prevention of Blindness

On behalf of the Executive Board of the International Agency for the Prevention of Blindness, it gives me great pleasure to welcome all of you participants from more than 60 countries, and particularly the national delegates, to this IAPB Fourth General Assembly here in Nairobi. This Assembly brings together representatives of the World Health Organization, international non-governmental organizations in official relationship with the IAPB, and 60 national committees to discuss the progress we have made in prevention of blindness activities during the past four years since the Third General Assembly in New Delhi.

The theme of this Fourth General Assembly is "Sustainable Strategies—Agenda for the 1990s." During this week we will discuss not only our achievements but also the obstacles that still remain to be overcome. The success of this Assembly will depend on your active participation in sharing your own personal experiences with the other participants from all over the world.

I would like to thank the following for providing support for this General Assembly: Alcon Foundation; Allergan International; Chibret International (Ophthalmic Group of Merck Sharp & Dohme); Senju Pharmaceutical Co., Ltd.; and Task Force "Sight and Life" (supported by F. Hoffmann-La Roche and Co.). Without their sponsorship this Assembly would have been impossible.

I also want to call special attention to the magnificent job that the Coordinating Committee here in Nairobi has done in making all of the arrangements that have ensured the success of this Assembly. Their efforts include the logistics for transportation, registration, and catering as well as the preparation of the venue including the translation services, meeting facilities, and the thousands of details that must be considered to ensure a successful General Assembly. They are: Prof. Henry S. Adala, Dr. A.K. Gikonyo,

Ms. Ute Lorenzen, Mr. David Paswa, Dr. Ashok K. Shah, Mr. Paul Streets, and Dr. D.S. Walia. I am particularly pleased to introduce the Chairman of the IAPB Fourth General Assembly Coordinating Committee, Mr. Samuel K. Tororei, the Chief Executive Officer of the Kenya Society for the Blind.

2

Welcome Address

Mr. Samuel K. Tororei
Chairman, Coordinating Committee, IAPB Fourth General Assembly
Chief Executive Officer, the Kenya Society for the Blind

Our distinguished guest, Honorable Mwai Kibaki, Minister of Health, Republic of Kenya; The President of the International Agency for the Prevention of Blindness, Dr. Carl Kupfer; Honorable Representatives from the Government of the Republic of Kenya and other Governments represented here today; distinguished WHO and other UN representatives; distinguished guests; observers; ladies and gentlemen:

I have the greatest pleasure to stand before all of you this morning to perform a humble but pleasant duty, perhaps the most pleasant of all duties required of me by the conference, to welcome you to this opening session of the Fourth General Assembly.

For us in Kenya, particularly for the members of the Coordinating Committee and Kenya's National Prevention of Blindness Committee, this opening ceremony marks an important landmark in our efforts. We can almost give a sign of relief and say, "Ah, you have all come to Nairobi at last and given meaning to our planning and anxieties!" I say almost because we shall not do that until the conference is successfully completed, and all delegates are satisfied. But nonetheless, I think the members of the Coordinating Committee deserve a big thank you for enabling us to meet in this venue today.

On their behalf, therefore, I wish to extend a warm welcome to all of you who have come from outside of Kenya and even to those of you who have come from outside of Nairobi. If I were the Mayor of Nairobi, I would say, "I give you the keys to the city." I can assure you that in Kenya much hospitality is available for the taking, if only you are able to make yourselves at home and interact with the beauty that is around you.

I also wish to note that this conference has set itself a practical

task: to discuss the importance of establishing sustainable programs to solve the problem of blindness globally. It is important that this Assembly is taking place for the first time in Africa. Recently, two colleagues of mine posed two pertinent questions with respect to the overall problem of blindness in Africa, which I will now paraphrase for you in the context of this conference. If the prevalence of blindness and visual impairment is as great as it is in the world today, what will happen by the year 2000 and beyond? Is the health for all concept achievable in respect to blindness and vision loss by the year 2000 given the present state of eye services?

I repeat these questions to illustrate that we have come here with a serious challenge. It is my hope that, as we make ourselves comfortable and feel at home as I have urged you to do, we shall always keep this challenge in the back of our minds.

Once again, welcome to all of you. I hope our arrangements are found to be adequate for your needs. But, if there are any shortcomings, please let us know and we shall do our best to help you.

3

Remarks

Dr. Akira Nakajima
President, International Council of Ophthalmology, the executive body of the International Federation of Ophthalmological Societies

The Kenyan Minister of Health, the Honorable Mwai Kibaki; Dr. Carl Kupfer, the President of IAPB; distinguished guests; ladies and gentlemen:

It is my great honor and pleasure to say a few words on behalf of the ophthalmologists in the world at this festive occasion of the opening ceremony of the IAPB Fourth General Assembly.

First of all, we would like to express our hearty congratulations to the IAPB for their brilliant achievements in the prevention of blindness in the world over the past decade. We would also like to congratulate the Coordinating Committee for organizing such a wonderful meeting. The International **Association** for the Prevention of Blindness was founded in 1929 as an organization under the International Federation of Ophthalmological Societies. The Association worked jointly with blindness welfare societies in promoting scientific knowledge about the prevention of blindness in the world. However, in 1975 the Association was reorganized into the International **Agency** for the Prevention of Blindness or IAPB.

Sir John Wilson, our honorary president for life, and Dr. A. Edward Maumenee, the former president of the International Council of Ophthalmology, and many other people were instrumental in the formation. The activities of the IAPB are jointly supported by the International Federation of Ophthalmological Societies (IFOS), the World Blind Union, and national societies for the prevention of blindness, as well as many non-governmental organizations (NGOs) active in the field of prevention of blindness.

The WHO set out to prevent blindness in 1970 and has included this cause in its regular program since 1979. Through the joint efforts of IAPB, WHO, national ophthalmological societies, national societies for prevention of blindness, and NGOs, prevention of

blindness programs are now active in a majority of countries throughout the world. In many countries, these prevention of blindness programs are often closely related to eye-care services at various levels.

The progress of eye-care science and the training of manpower necessary for appropriate eye-care services are often the responsibility of national ophthalmological societies. Also, because good visual function is directly related to the quality of life of any group of people, at its international congresses IFOS has organized symposiums on the prevention of blindness and on the education of ophthalmologists.

I sincerely hope that the prevention of blindness activities in the world, coordinated by the IAPB, will continue to protect the eyesight of an increasing and aging world population. The IFOS and the IAPB will continue to work together to alleviate this problem. Our task ahead is formidable. I wish you all the best for the success of the IAPB, and of the meeting.

4

Remarks

Mr. Alan W. Johns
Vice-President, International Agency for the Prevention of Blindness
Chairman, NGO Coordinating Committee

An international conference of this nature could have been held in any one of a dozen or more capital cities in the developing world. It is therefore all the more significant that, when the Consultative Group of Non-Governmental Organizations to the WHO Program for the Prevention of Blindness met here in March 1988, they were unanimous in wanting the Fourth General Assembly to be held in Africa and, if at all possible, in Nairobi.

A number of factors are involved in choosing a conference venue. The most important is ensuring that the host country welcomes the prospect. That was assuredly so in Kenya's case and was anticipated by the NGO representatives. They wanted to bring IAPB delegates from many countries to East Africa and to Kenya, where by far the largest number of IAPB's international NGO members gained their knowledge of the strategies appropriate to conditions in Africa.

This is the region in Africa, particularly Kenya and Tanzania with their communities scattered over the vastness of the rural areas, where the task of bringing ophthalmic resources to where they are most needed was first addressed by the efforts of pioneer ophthalmologists such as Dr. Geoffrey Bisley and Dr. Joseph Taylor. They, I am pleased to tell you, are with us in this Assembly today. Among many initiatives, they were the first to train ophthalmic assistants for a mobile clinic role—that cadre of ophthalmic personnel which has since benefitted the lives of many millions of Africans and greatly strengthened the objectives of the all-too-few ophthalmologists who practice in Black Africa.

When I think back on my introduction to prevention of blindness activities in Africa, I am reminded instantly of my first visit to Kenya in 1979 and meeting the International Eye Foundation's team on the slopes of Mount Kenya as they put together one more part of the Kenya Government's Rural Blindness Survey—another

milestone in the understanding of causes and intervention levels that was to lead, in Kenya's case, to the establishment of the National Prevention of Blindness Committee that so effectively guides the national program today.

Africa, then, for many international NGOs, attracts attention and a fair proportion of resources by virtue of its needs. As one of the NGO representatives who met in 1988, I am delighted that it has proved possible to hold this Assembly here and am confident that its African delegates will bring a powerful urgency to all of our discussions. I say that without in the least wishing to overlook the fact that this is an Assembly of an international agency with a global agenda to consider. You can find the Consultative Group of NGOs working in many parts of the world. What they do in Africa is a part of that global movement, acting with and through national partners of which the IAPB has always seen itself as the catalyst.

Each of these Assemblies to date has provided an opportunity for the Agency to examine its role and probe its capabilities. This one, with its theme of "Sustainable Strategies—Agenda for the 1990s," can be no exception. I sense we have a lean period ahead of us, with the multiplication of needs in the developing countries and the newly recognized needs of Eastern Europe set against the backcloth of a world economy contending with so many priority issues.

With these circumstances in mind, we need here to formulate an agenda for the Agency consonant with our theme: a prioritizing of our objectives, a radical enhancement of the association between all categories of our membership, and a strengthening of the ties between the Agency and its regional and national committees. This will be a mammoth task, as it has been throughout the Agency's history, but the communities we serve will expect no less of us.

5

Inaugural Address

Hon. Mwai Kibaki
Minister of Health, Republic of Kenya

It is my great pleasure to speak at this General Assembly this morning, particularly because the persons gathered here not only come from many countries with diverse needs and programs, but because you represent the main organizations and the top eye surgeons and eye-care workers involved in policy formulation and implementation in your countries.

I am informed that this is the fourth time the International Agency for the Prevention of Blindness has met since it was founded in 1975. I am pleased to note that Kenya has been privileged to become the first African country to host this assembly, and now joins the United Kingdom, the United States, and India in the honor of entertaining the IAPB. Kenya believes very strongly in the value of international friendship and human endeavor based on the principles of peace and goodwill to all mankind. I am happy that as the festive season which embodies the message of goodwill and love among all people draws near, we are gathered in this conference center to consider just such and to act: bringing all our faculties and all the resources at our individual and collective disposal to bear on the prevention and cure of blindness, not just in our individual countries, but in the world at large. To me, this is a comforting thought. Comforting because all we hear nowadays is information about conflicts among people who have no reason to hurt one another. Here we are gathered to deliberate on the possibilities of removing or limiting the effects of one human misery, blindness.

At this point, I think I should share with you a quotation about the importance of health to humanity and illustrate the importance of our efforts at this Assembly. It reads: "Good health is one of the most important contributors to individual welfare. It is an essential prerequisite to the enjoyment of almost any other aspect of life. And, poor health, which leads to death, will make all other sources of satisfaction irrelevant."

Even though most causes of blindness do not lead to death, blindness does cause enormous social and economic suffering to some 35 million citizens of our present world. And yet it seems we have the technological possibilities to overcome it. Where have we gone wrong? What is it that we should be doing or should have done and have not? No doubt these and other questions will form the core of your discussions for the rest of this week. I am informed that you have set for yourselves the task of exploring the possibilities of developing sustainable programs aimed at eliminating preventable and curable blindness. I think this is the way to progress. The key is the word "sustainable." Perhaps it is in our planning that we have gone wrong, when we failed in the past to consider the sustainability of our programs. Now is the time to go back and see if we can put things right. We must look at our varied programs and learn what we can from them.

In a small way, we in Kenya hope to contribute to this process of self examination by laying before you our own ophthalmic program for scrutiny. I would like to say a few words about it before you have a chance to experience it first hand. We estimate that Kenya has nearly 250,000 blind persons, over 70 percent of whom need not be blind. The primary causes of blindness in Kenya have been identified to include cataract, trachoma, and glaucoma. Those of us gathered here know that it is possible to cure cataract through simple surgery, and that trachoma, xerophthalmia, trauma, and eye infections can be prevented.

Kenya has therefore set its priorities to deal with these specific situations. The Kenya Ophthalmic Program has been in existence since the 1950s and has steadily expanded both in the coverage of geographical areas and in the scope of services it provides. From the outset, our government accepted and welcomed non-governmental organizations to assist it in providing eye care. This arrangement has enabled us to develop the program we have today. We as a Ministry are most grateful to our NGO friends for their contribution. I believe that this cooperation, which we have built over the years, will continue and grow stronger.

Let me highlight a few achievements we have recorded in our ophthalmic program. Kenya pioneered the use of ophthalmic clinical officers in cataract surgery. We now have 20 of these officers performing cataract surgery in district and provincial government hospitals under the supervision of our eye surgeons. In addition, we now have a staff of 100 Ophthalmic Clinical Officers, forming 5 percent of the entire Clinical Officer population in 1989–90, as

compared to only one individual in 1960. Both these groups of officers must be adequately supervised by ophthalmologists. Our ophthalmic training program at the University of Nairobi has produced some 25 ophthalmologists since it was started in 1979. Ten of these doctors were non-Kenyans and are now serving in many parts of Africa and beyond. We now record that all our provinces and two major districts are covered by ophthalmologists. Additionally we still have enough of a surplus to teach at the University and at the Kenyatta National Hospital. I think we have a good reason to share our joy with all of you.

Along with the tremendous manpower development just noted, there has been steady growth in the scope of the program. In the 1950s, our program consisted primarily of a curative unit at the Kenyatta National Hospital. Since 1960, when the first outreach program was started with assistance from the Kenya Society for the Blind and the Royal Commonwealth Society for the Blind in the form of a mobile eye unit, our outreach program has grown to nineteen mobile eye units serving over 30 districts in the Republic of Kenya, an additional mobile teaching unit employed in primary eye health education, and an air service taking doctors to the more inaccessible parts of this Republic and neighboring countries.

This growth of outreach programs was matched by a constant growth of static eye clinics. Currently there are 46 such clinics throughout the republic. This means that more than half of the district hospitals have an eye clinic manned at least by an Ophthalmic Clinical Officer. The Ministry, through the coordination of the National Prevention of Blindness Committee, has accepted a program aimed at upgrading eye clinics throughout the country. The program has started by upgrading the provincial and major district hospitals. So far, some 120 eye beds and five eye wards have been added over the last five years through assistance from Sight Savers (Royal Commonwealth Society for the Blind) of the United Kingdom, Operation Eyesight Universal of Calgary, Canada, and the Kenya Society for the Blind.

I am pleased to note that the program is poised to grow even faster in the future. Staff and hospitals require additional surgical equipment and drugs. We are addressing this issue squarely. The first National Eye Drops Production Unit has just opened with the assistance of Operation Eyesight Universal and Christoffel-Blindenmission of Germany. In time this unit will be expected to produce the 12 basic eye drops necessary to treat the major eye

conditions in the country. Supplements will be needed, but this will give the program great flexibility and ability to provide services. The National Prevention of Blindness Committee is also engaged in constantly reviewing the state of the surgical and diagnostic equipment in all the eye clinics and replenishing their supply whenever necessary.

The few achievements I have highlighted above only serve to illustrate our determination to prevent and treat blindness in our Republic. Central in this effort is the Ministry's Prevention of Blindness Committee, charged with the responsibility of overseeing the whole ophthalmic program. This committee is doing a good job, and the Ministry is committed to its further strengthening to enable it to perform even better. For this reason, the Ministry appointed an eye surgeon specifically to serve as the program's coordinator and to strengthen the link between the Ministry and the collaborating NGOs. Additional staff have and will continue to be assigned to the Committee's Secretariat as the need arises.

I am therefore optimistic about the future of our ophthalmic program. I see a future of greater effort which will yield better results. Last year, the Kenya Ophthalmic Program examined and treated well over 500,000 Kenyans suffering from eye disease. I am sure this number will continue to increase in the future. In 1984, eye diseases represented 3.02 percent of all reported diseases. In 1986 this had dropped to 2.66 percent. Likewise, cataract represented 0.12 percent of all reported diseases in 1984. However, it dropped to 0.11 percent in 1986.

Finally, it is known that cataract is responsible for approximately 50 percent of blindness in developing countries. In Kenya however, recent surveys have established that cataract causes only 30 percent of the visual loss in this country.

Let me once again welcome you to Kenya. Feel at home, and please do not go home without visiting our game resources or tasting our cultural heritage in other ways. Also, I wish you all fruitful discussions in this Assembly as well as a happy stay in Kenya.

Thank you.

6

Vote of Thanks and Affirmation

Dr. Moses C. Chirambo
IAPB Vice President—Africa

Our Chief Guest, the Honorable Mwai Kibaki, Minister of Health in the Government of the Republic of Kenya; Dr. Carl Kupfer, President of the International Agency for the Prevention of Blindness; Samuel K. Tororei, Chairman of the Coordinating Committee of this Assembly; senior representatives from the Government of Kenya; representatives of other participating governments, United Nations agencies, and of international and national non-governmental organizations; delegates; ladies and gentlemen:

My duty is a pleasant one because it involves the thanking of all of you who are here this morning. But it is a challenging task because I might fail to mention some very important contributors to the success of this Assembly. Should this happen, please accept my apology, and understand that I have thanked you even if I have not mentioned you by name.

I am sure all my colleagues join me in thanking the Honorable Mwai Kibaki and his officers for finding time in their busy schedule to come and participate in our opening ceremony this morning.

I want to thank Honorable Kibaki for personally making the statements we have all heard. The International Agency for the Prevention of Blindness can be assured that the Kenya Ophthalmic Program is in good hands under the guidance of Kenya's Ministry of Health.

Surely we all appreciate the efforts of the IAPB President, Dr. Kupfer, who has guided the Agency for the past eight years. I thank him and his staff at the National Eye Institute for all they have done, and especially for persuading the Executive Board to choose Kenya as the venue for this Assembly. This is an honor for the whole of Africa, and a demonstration of IAPB's commitment to the whole world.

You will of course remember that the First Assembly was held in Europe, the Second in America, the Third in Asia and now the

Fourth is in Africa. This Assembly could not have taken place without the participation of several governments, United Nations agencies, and international as well as national NGOs. I thank you all for your commitment to and understanding of the ideals of the IAPB.

Last, but not least, I must thank our hosts—the Kenya Prevention of Blindness Committee and this Assembly's Coordinating Committee. Without their hard work and commitment, I cannot see how we could be seated in this beautiful conference center as we are now.

In addition, our thanks go to the management of the Kenyatta International Conference Center, the various airlines that brought us here, the hotels that are providing us wonderful hospitality, and tour organizers that have or will facilitate visits to see the beauty of Kenya.

I think we should all give ourselves a round of applause.

Thank you.

7

Keynote Address

Dr. Bjorn Thylefors
Program Director, Program for the Prevention of Blindness, WHO

The theme of this, the Fourth General Assembly of the International Agency for the Prevention of Blindness (IAPB) is "Sustainable Strategies—Agenda for the 1990s." This reflects the achievements over the last 15 years in the field of blindness prevention, which were also apparent during the Third General Assembly convened in 1986 in New Delhi under the motto "A Decade of Progress."

It may be useful to all of us to briefly review this situation, and try to critically analyze what we have achieved, and where constraints remain. This in turn may help us to more easily come to grips with what we expect will be sustainable developments in the 1990s.

First of all, one major achievement today is the worldwide awareness of blindness as a major disability problem, causing far-reaching social and economic consequences apart from the aspects of human suffering and quality of life. The strong rationale for preventing blindness is being recognized all over the world, but we still seem to have difficulty in translating awareness into action in a number of countries.

Undoubtedly, this is partly due to the present harsh financial climate in most developing countries, where an increasing number of priorities compete for shares of a decreasing health-care budget. This very difficult priority setting between endemic "killing diseases" and those that "only" result in morbidity and disability is today the tough reality in many ministries of health, particularly in the least developed countries.

The second echelon of achievements should include the development of the primary eye-care concept within primary health-care systems as the strategy for all countries within the context of WHO's "health for all by the year 2000." Much progress has been made in this field, with both positive and negative experiences. Nevertheless, today primary eye care is a universally accepted approach with manifold practical projects behind it. Undoubtedly, the further

development of primary eye care as part of countries' health-care systems will be one of the main preoccupations for sustainable programs in the 1990s.

A third major achievement over the past decade of blindness prevention has been the establishment of national prevention of blindness programs — today in 66 countries. These national programs and committees constitute proof that our approach of bringing together ministries of health, WHO, and international non-governmental organizations has been right and worthwhile. This is another matter which must be given all our attention when considering strategies for sustainable programs in the 1990s. It is no secret that many of these national programs are still in critical need of external support, which so far has been granted by the member organizations of IAPB and by others.

Finally, to keep this list short, the fourth area of significant progress is in the development of collaboration between the non-governmental organizations and WHO in the field of blindness prevention. Much of this achievement has been accomplished by the IAPB, in bringing the interested organizations together and in playing a supportive role to the WHO Program. Fortunately, the role of non-governmental organizations as partners in health development is now much more accepted by the United Nations (UN) technical agencies. Furthermore, the role of non-governmental organizations is of growing importance; their very positive contribution is even more apparent now because of the increasing resources being made available.

Having looked briefly at the achievements that have been made, we must turn to the more somber picture of the chief remaining constraints in the struggle for action in the blindness prevention field. Again, the list will be short, to focus only on major issues.

The main obstacle to action in many countries is still the absence of political will. This should not be seen necessarily as indifference among national authorities, but rather as a reflection that the case of blindness prevention has not yet been presented clearly enough, there being perhaps a lack of reliable data on visual disability and its consequences, or perhaps a rational and cost-effective program of intervention has not been identified. There are of course many other possible reasons for the lack of commitment of a government to the prevention of blindness, but we should all ask ourselves where the main problem lies in such circumstances. If there is a difficulty of program structure or resource mobilization, it may be dealt with

relatively easily, as a technical matter, but the political climate will still determine how much progress will be made.

A second obstacle, in some countries, is the ambivalence of eye-care professionals. This implies the will and commitment of ophthalmologists and health administrators to change their working habits and to shift from individual, clinic-oriented eye care to the needs of the community, particularly in neglected rural areas. Other professional concepts include team work, delegation of tasks, supervision of personnel, and management of health programs. However, these matters are not easily dealt with, and most of us working in this field are ophthalmologists with clinical rather than managerial backgrounds. Nevertheless, it is obvious that the ophthalmologist is expected to take the lead in blindness prevention programs in many countries, and he or she needs to be better prepared to undertake all of the tasks implied.

The ophthalmologist may also have to be prepared to give up some of the professional satisfaction of using sophisticated technology in individual care, rather than cost-effectiveness in public health programs. This point will be highlighted again later in this presentation.

Last but not least, in this short list of constraints to blindness prevention, is the topic of resources, in particular those problems related to manpower and to money. It is significant that this General Assembly takes place in Africa, where we know there is only 1 ophthalmologist available for every 1.2 million people. To make it worse, we cannot only consider numbers here, but also the **maldistribution** of qualified personnel, with most specialist services available only in major urban agglomerations.

Whatever solutions we can propose to solve the problems of manpower scarcity and maldistribution will help to make progress towards establishing sustainable national blindness prevention programs. With regard to money, the lack of a reasonable budget for a national program or field work hampers activities in many countries, but again it usually reflects the harsh economic climate that most of the least developed countries will have to live with for the next decade, at least. The 1980s has been a "lost" decade in terms of the economics in those countries, and we can only hope that the 1990s will be more positive.

The major international non-governmental organizations represented here spend well beyond $30 million per year in support of blindness prevention, and this may well increase in coming years.

However, even a larger amount will probably still be insufficient, and caution will have to be exercised in the use of such external resources, whether they come from non-governmental organizations, WHO, or other sources, so as not to create a dependency within these countries and national programs on intervention schemes or technology that they cannot afford, and therefore sustain, in the long run.

I would like to turn now to what the role of WHO, with its Program for the Prevention of Blindness can be, including working with non-governmental organizations, particularly those represented here today, that work at the international level:

The WHO Program will certainly continue to stimulate Member States to do more about blindness prevention, supporting its advocacy with technical advisory services through visits to interested countries by consultants or staff. Available information on blindness and documentation on strategies for specific disease control and national program development will be made available to any national coordinator or appropriate group.

Of particular interest in this context is the simplified methodology for population-based assessment of blindness and its causes, now tested in a number of countries with very satisfactory results. The same, or similar methodology may be adapted for monitoring or evaluating results in national programs—which is another domain where WHO may be able to help countries, depending on the budget available. The issue of evaluation of program interventions and results is becoming increasingly important and it is today often a *sine qua non* for funding from many agencies. Moreover, the 1990s should be the decade when many national blindness prevention programs start showing really demonstrable results in terms of disease control and disability reduction.

The development of suitable strategies for blindness prevention schemes in countries will be continuously considered through WHO support to meetings at the national, regional, and global or interregional levels. The collective wisdom and experience gained in a number of countries will certainly be of great value to others—this is part of the working principles and procedures of WHO. The Prevention of Blindness Program has developed, over the years, rather extensive documentation with guidelines for various blindness prevention activities, and this will be continuously considered in the future. However, as with all cookbooks or recipes, they are

useful only when all of the ingredients are there. Unfortunately, this is still not the case in all developing countries.

To overcome part of this constraint, efforts will continue to mobilize additional resources to the WHO Program, in support of selected national programs. Other measures of support may include the convening of national seminars or workshops, fellowships or grants for postgraduate studies, particularly in relation to public health ophthalmology, and the purchase of ophthalmic supplies and equipment in certain countries. However, it has to be stated now that the extent to which the WHO Program will be able to support all these activities will depend on how much extrabudgetary support can be mobilized, and on how much the Program will be in demand by Member States and included in their WHO budget for technical cooperation. As a rule, over the last decade, a majority of the funds in the WHO Program has been of extrabudgetary origin, and we hope this favorable trend will continue through the 1990s.

In discussing the role of non-governmental organizations (NGOs), the first point is that of advocacy. The NGOs can work freely in this context to stimulate general awareness and public education and to mobilize community support through various mechanisms. Whereas the WHO communication channel is usually strictly through the Ministry of Health, the non-governmental organizations can work in a broader context, and the two spheres should complement each other very easily.

Secondly, work at the "grassroots" level in health projects gives the non-governmental organizations a lot of very valuable field experience and close community contact. This may be very useful in developing and testing alternative approaches to eye-care services or disease control, and can be usefully linked to WHO or governmental schemes on a research or service basis.

The development and strengthening of manpower is another area of great concern to all interested parties, where the non-governmental organizations have often taken the lead in new approaches to training and development of curricula, particularly for auxiliary health personnel. The training of ophthalmic assistants, or clinical officers, in most of the African countries today, is an example of such action by NGOs, which is now being taken up and supported by WHO and ministries of health. Looking around the world, much of this training of personnel in eye care is, however, still being supported

mainly by the international NGOs. This is particularly true in African countries.

The support provided in many countries to national prevention of blindness committees by international NGOs is very important in helping national programs to get started. Moreover, this support often comes before there are official governmental budgets in order, or while waiting for contributions from interested donors. Such a mobilization of resources through the NGOs is of critical importance in a number of national blindness prevention programs. This situation is likely to continue as far as some of the least developed countries are concerned, where major new resources are not likely to come forward within the foreseeable future.

Another important role for the NGOs and WHO is the development of training aid in eye care. There has already been a successful experience of joint work between the WHO Program and interested NGOs, using available experience and possibilities for field testing of new material. The printing of such training aids in various languages by WHO and the distribution through both NGO and WHO channels offer obvious advantages for all involved. Similarly, the documentation and dissemination of developments in appropriate technology for eye care, as in the field of low-cost spectacles and the local production of eye drops, can profit from the joint work of NGOs and the WHO Program.

Having looked at the possible roles of the WHO Program and the collaborating NGOs in support of eye-care and blindness prevention programs, we may now turn to the issue of requirements and strategies for sustainable national programs in the 1990s. It is, of course, only possible to highlight some of the key issues, and not necessarily in order of priority; each country has its specific setting in that context.

The following nine points should be considered in the scenario of sustainable programs:

1. To obtain baseline data on blindness and its causes in countries where this is still needed for program planning. This refers to those countries where there is a critical absence of reliable data and where extrapolations to other settings are difficult. The WHO simple population-based survey methodology could be used in small-scale assessments for reasonable costs in most of those countries over a short period of time. The main constraint here is the lack of funds to cover

local costs, including transport. It is likely that, unless the lack of data is overcome in those countries concerned, any firm governmental commitment cannot be expected, and thus any program will be delayed or not started.

2. To improve communications between national coordinators, or blindness prevention advisers or groups, and political decision-makers, and to firmly establish and **maintain** blindness prevention as a priority issue. This communication should maintain visibility and commitment by channeling information from ongoing programs to ministries of health and the public.

3. To develop further eye care as part of primary health care, wherever needed, and to look carefully at cost implications. Such eye-care schemes should also be evaluated from the consumer's point of view to make sure they are seen as appropriate.

4. To increase public awareness and to mobilize more community support for eye-care and blindness prevention schemes, ensuring full utilization of available services and thus optimizing the cost-benefit aspect.

5. To create a manpower development situation that makes full use of specialist services, but for specialized care only, with proper delegation of other tasks and routine work. This implies a heavy reliance on trained auxiliary personnel in many developing countries in the present and probably a persisting scarcity of specialists, particularly in rural areas.

6. To set up an efficient managerial structure for the national program, with promotion of teamwork, and with regular support to and supervision of personnel at the primary health-care level from those higher. It is important that there is a two-way communication channel between the levels of eye care. In addition, a meaningful feedback on reporting procedures is a must, if they are to succeed.

7. To include an obligatory component of monitoring and evaluation in all national programs, in order to demonstrate success or failure, and to analyze constraints in program procedures. The options for evaluation mechanisms, as worked out by the WHO Program should be considered and adapted

to local needs. Obviously cost-effectiveness has to be borne in mind when setting up evaluation schemes, but any sustainable program should reliably document results and achievements.

8. To vigorously pursue the mobilization of resources for national programs on the widest possible scale. Attention should be given to bilateral aid agreements, where a health project component exists that could include eye care. Other potential contributors may include community support groups, industry, and interested humanitarian or commercial societies in some countries. The financing of health services is a field where new and innovative approaches are particularly needed, and it is likely to become the most critical issue for sustainable strategies and programs.

9. To set up a mechanism for applied research as part of national programs, which may be used to generate, test, and evaluate technology and procedures for improved program interventions. Operations research, looking at the streamlining of a specific process, is of particular interest to ensure and to document the optimal utilization of available resources.

It is not possible to specify one single critical factor for sustainable national blindness prevention programs. However, it is likely that the three issues of resources, managerial structure, and evaluation of results will become the major issues during the coming decade. There have been various estimates as to the level of funding that would be needed to solve the world blindness problem. However, of more importance is the rapidly growing magnitude of the problem if the present situation is not tackled immediately. The often quoted estimate that the world's blind population will have doubled by the year 2025, if no major action is taken now, still stands. However, it can be confidently stated that a lot can be done between now and the year 2000.

If we want to achieve a major impact on the burden of blindness in developing countries, there is a clear need to unite the forces of ministries of health, WHO, and non-governmental organizations, and to put all efforts and resources into attacking the public health dimension of blindness, which is solvable today, but perhaps will not be manageable by the generation of tomorrow.

PART 2

PLENARY SESSION I

National Programs in Africa

WORLD BLINDNESS AND
ITS PREVENTION
VOLUME 4

1

National Program Development: East and Central Africa

Dr. Moses C. Chirambo

In 1984, it was estimated that there were between 27 and 35 million persons blind (based on the WHO definition of best-corrected visual acuity in the better eye of less than 3/60) from all causes. Of these, 6 million blind persons live in Sub-Saharan Africa. The main causes of blindness and visual impairment are cataract, trachoma, onchocerciasis, glaucoma, trauma, and nutritional blindness due to measles and vitamin A deficiency.

Although there are no exact prevalence rates of blindness in most countries of the African Region, inferences made from a few population-based surveys suggest that the blindness rate (visual acuity in the better eye of less than 3/60) in the region is 1.0 to 1.5 percent. Almost all the countries of the region have formed national committees for the prevention of blindness. However, not all of these committees are currently active.

With the exception of onchocerciasis, it is possible to formulate plans for the prevention of blindness on the basis of a 1.0–1.5 percent blindness rate without waiting for population-based surveys. With this in mind, Tanzania, Zambia, Swaziland, Botswana, Lesotho, Uganda, Sierra Leone, and Ghana have formulated national plans.

In Africa there is an acute shortage of skilled manpower. The ratio of doctor to patient varies from 1 doctor per 15,000 to 1 doctor per 50,000, and there is only 1 ophthalmologist for every 1,000,000 Africans. Coupled with this ratio is the very high population growth of 3.5 to 4.5 percent per year. This means that despite intensive medical training programs, the doctor-patient ratio will not improve. We must, therefore, lean increasingly on the use of non-ophthalmologists to fill the many gaps. This will most certainly apply to staffing of clinics at all levels of eye-health care.

One of the most remarkable features of the development of

international NGOs for the prevention of blindness during the past years has been the shift from direct service to manpower development. More and more, direct service on the part of international NGOs working in Africa, such as Sight Savers, Christoffel-Blindenmission (CBM), the International Eye Foundation (IEF), and Helen Keller International (HKI), see direct service as necessary components of sound teaching rather than as an end in itself. The main thrust during the period under review therefore has been the development of training programs for eye-health personnel within the eye-care programs.

In Kenya, Gambia, Ethiopia, Sierra Leone, Zimbabwe, Tanzania, and Malawi, training that leads to a designation of ophthalmic assistant is being offered at the paramedical/nursing training centers. The ophthalmic assistant is used to provide eye-care service at the primary and secondary levels.

In a few countries of East, Central, and Southern Africa some ophthalmic assistants and general medical officers are being trained as cataract surgeons. Kenya, Tanzania, and Malawi train ophthalmic assistants as cataract surgeons and Zimbabwe trains general medical officers as cataract surgeons. Training leading to a postgraduate qualification in ophthalmology is conducted in Mali, Nigeria, Kenya, Uganda, Ghana, and Tanzania. However, the output of ophthalmologists in these institutions is still inadequate to meet national manpower targets. In most of these training programs, the implementation is a cooperative effort within the country and includes the WHO and non-governmental organizations such as Sight Savers, Operation Eyesight Universal, Christoffel-Blindenmission, Helen Keller International, and the International Eye Foundation.

During the last several years, WHO and international NGOs in collaboration with ministries of health have organized several workshops. During July 28–29, 1987, Malawi hosted a Southern African Subregional Ophthalmic Training Center (SADCC) Technical Expert Meeting on the training of ophthalmic assistants for the region. Besides the review of the training program, participants discussed the role of IAPB in the formation of national committees for the prevention of blindness. The last several years have witnessed the formation of more national committees for prevention of blindness, the development of national plans, and the establishment of training programs for the secondary level of eye-health care.

2

National Program Development: Ethiopia

Dr. Pawlos Quana'a

THE ETHIOPIAN PREVENTION OF BLINDNESS PROGRAM (EPBLP)

The EPBLP was formally established in 1986 along with The National Committee for the Prevention of Blindness (NCPBL). The EPBLP's broad goal is to reduce the estimated rate of blindness in the country from 1.5 percent to 0.5 percent. Its main activities so far have been: carrying out limited field surveys, participating in school health programs, performing tarsotomies in the field, participating in the field training of ophthalmic medical assistants, and distributing educational posters and Vitamin A in collaboration with the International Eye Foundation and Helen Keller International.

Ethiopia is committed to implement primary health care as a means of achieving health for all by the year 2000. Good ground work has been laid to enable the realization of this goal. Our goal of blindness reduction can only be achieved through this means. Unfortunately, manmade and natural calamities have been thwarting all the efforts that Ethiopia has put forth. Our nation is striving to catch up with other African countries in program coverage.

DEMOGRAPHIC CONSIDERATIONS

1990 estimated population	52,000,000
Infant mortality	139/1000
Life expectancy	48.5 years
Population growth	2.9%
Birth rate	4.6%

HEALTH FACILITIES AND MANPOWER CONSIDERATIONS

Hospitals	89	Ophthalmologists	24
Hospital beds	11,779	Eye resident trainees	15
Clinics	2292	Ophthalmic medical assistants	59
Ophthalmic centers	16	Community health agents	14,319
Health centers	160	Traditional birth attendants	12,219
Ethiopian doctors	1658		
Health officers	90		
Nurses	3575		
Health assistants	10,045		

By utilizing these health workers, it should be possible to inculcate the importance of blindness prevention both in health professionals as well as in the general public.

SUSTAINABLE STRATEGIES

The EPBLP is attempting to plan feasible programs that will be maintained for the duration of the 1990s. To make any of its programs successful, trained manpower, financial resources, and sound administrative support must exist.

In the last three years the International Eye Foundation (IEF) and Helen Keller International (HKI), in collaboration with the resident staff of the Addis Ababa University, have trained 59 ophthalmic medical officers and equipped them with basic ophthalmic instruments.

However, the one-year training of these officers is inadequate if we are to tackle the existing cataract backlog. Refresher courses at their training sites as well as their remote working places must be devised; and such an upgrading course is planned for early 1991.

Ethiopia has become like a marantic child who, with each recurring infection, has to be resuscitated. Prof. Nakajima aptly stated in the August 1989 issue of the *IAPB News* that "World peace and economic prosperity form the basis for good health. . . ."

Ethiopia and the EPBLP are optimistic that tomorrow will bring about a situation in which sustained strategies in the prevention of blindness can be implemented throughout the country.

3

National Program Development: The Gambia, including Demographic and Manpower Considerations

Dr. Hannah B. Faal

The Gambia is a small country on the west coast of Africa comprising 10,600 square kilometers and a population of 800,000. Unfortunately, The Gambia is one of the least developed countries in the world and depends on tourism and the export of peanuts for revenue.

The Gambian government attaches great importance to the development of a sustainable health service. In the pursuit of this goal in 1979 The Gambia offered itself as a model for the development of a primary health-care system to the West African Health Community. The development of the National Eye-Care Program has been aided by The Gambia's small population and geographical size.

The National Eye-Care Program was started in 1985 with the dual objective of reducing blindness prevalence rates and making eye care available to the entire population through primary health care. It has this general pattern: community-based eye services are provided by community personnel; general health facility services are provided by general static health facility workers. Ophthalmic health is provided by ophthalmic paramedics at a service facility at the second level, as well as by staff at a facility at the third level, which includes an ophthalmologist. There is movement between the different levels: downwards through patient referral chains and upwards through health personnel for training, supervision, support, and outreach work.

This six-year Program has had three phases, with coverage of one region for every two-year phase. Three medical regions have been covered: West Africa, Central Africa, and East Africa.

ACHIEVEMENTS

In 1986 a population-based national survey provided the following data on blindness. The prevalence rate of blindness was 0.7 percent and the major causes of blindness were: cataract (55 percent), trachoma/corneal scaring (17 percent), and other corneal scaring/phthisis (20 percent). The survey also provided the geographical distribution of blindness by cause in The Gambia. The survey design, methodology, results, and recommendations were made available to WHO for adaptation by countries and regions in similar geographic and economic circumstances.

MANPOWER DEVELOPMENT

Although we started with only one ophthalmologist and one ophthalmic nurse, so far the following personnel have been trained or are currently in training: one ophthalmologist in training, two cataract surgeons, four ophthalmic medical assistants, two community eye health educators, and two dispensing opticians.

STRATEGIES ADOPTED

The following strategies have been adopted because of The Gambia's lack of specialist manpower: short, practical training for the ophthalmologists; use of paramedics trained from available medical personnel; use of cataract surgeons; employing a slow pace of training—one ophthalmic medical assistant per year is trained in Malawi; multidisciplinary training for specialist ophthalmic staff, includes community eye health concerns and teaching skills; and the use of a primary eye-care education unit.

PRIMARY EYE-CARE TRAINING MODULES

These modules have been developed for the following non-specialist cadres: village health workers and traditional birth attendants; school eye-health teachers; community health nurses; health center staff; leprosy attendants; and students of nursing, public health, and teacher-training institutions.

The Gambia's primary health-care structure has been well established, making it easier to integrate primary eye care. Nearly the entire western region of the nation has been covered.

SUPPORT SERVICES

A local eye-drop production unit has been set up; and a low-cost spectacles workshop has been established. Also now in place are: mobile eye units, which are used primarily for community training; facilities for outreach cataract surgery; and satellite clinics in peri-urban areas.

SPECIAL PROGRAMS

Cataract

In The Gambia cataract is responsible for 55 percent of blindness and has a backlog of 5,500 cases. The following strategies have been adopted: a two-table, two-surgeon routine in the operating theater; patient recruitment by community health workers; patient screening by community eye nurses; outreach village health center cataract surgery with patients discharged the first day after the operation to homes in the same village and daily wound dressing by a community health nurse; and eye examination and dispensing of standard +10.00 spectacles one week after the operation by the ophthalmic staff. By employing these strategies and performing 500 operations per year, we have been able to keep up with the estimated incidence.

Trachoma

Lid surgery techniques have been taught to all ophthalmic medical assistants and community eye nurses; the number of patients requiring surgery is steadily decreasing.

In an attempt to control trachoma, all specialist staff are taught the risk factors for trachoma, its recognition, treatment, and preventive measures. The WHO primary health-care management of trachoma has been field-tested in The Gambia; and the development of a protocol for its adaptation to The Gambia is in process.

STATIC FACILITIES

The original hospital eye unit has been expanded and upgraded for service and training. A secondary eye center has been established in the central region of the country.

Monitoring and evaluation indicators have been limited to

enumerating the following: patients seen, surgical procedures performed, personnel trained, and facilities established.

In summary, eye care in The Gambia has been integrated into the primary health-care structure of the western region of the country. Other strategies and modules have also been developed in The Gambia for replication in other regions of Africa.

The Gambia Eye-Care Program cooperates with the International Centre for Eye Health in London particularly in the areas of training and research and with the WHO Prevention of Blindness Program in field research and workshops. Sight Savers (Royal Commonwealth Society for the Blind) has assisted in the development of The Gambia Eye-Care Program as a model for providing more ophthalmologists.

PROBLEMS, FAILURES, AND CONSTRAINTS

In areas of overlap or dependence on other service areas, there often are problems when the recognition of need and the development of strategies are performed by eye-care personnel but the task of successful implementation is left to personnel other than those in the eye-care field such as opticians, pharmacists, and civil servants.

Often there are problems when a new cadre and career structure is developed from established professional bodies. Examples include instructing ophthalmic medical assistants, and teaching nurses to be cataract surgeons. The low-priority status accorded blindness by health planners when compared to life-threatening conditions is a major concern. Perhaps such issues can be addressed in future workshops.

The Gambia Eye-Care Program aims to: expand into the central and eastern regions of The Gambia, consolidate in all areas, and through monitoring and evaluation identify areas of weakness and correct them; act as a stimulus and share experiences with other countries in West Africa using what has been learned from the East African national programs; and, after having achieved a minimum eye-care service for the entire country, improve on the sophistication of sustainable service at the tertiary center.

4

WHO Technical Cooperation in Africa, a Situation Analysis

Dr. T. Tukai
Acting WHO Representative, Nairobi, Kenya,
on behalf of the Regional Director,
WHO Regional Office for Africa

The Regional Program for Prevention of Blindness started in 1978. The subsequent General Program of work acknowledged the social and economic impact of blindness and has made its prevention a major priority. Whereas the prevalence of blindness in the countries of Latin America is 0.2 percent, the rate in the Africa Region has been estimated to be 1.2 percent; but in some countries the rate is as high as 3.0 percent. Given that the total population of the region is about 400 million, it is acknowledged that about 5 million people are blind, and more than twice this number are afflicted by severe visual impairment.

This trend has been confirmed by national population-based surveys carried out in the Congo and Togo last year. Other limited surveys were also carried out in Burundi, Central African Republic, Chad, Gabon, and Zaire in Subregion II and Botswana, Lesotho, and Mozambique in Subregion III.

Country reports have also confirmed the general paucity of important health personnel resources such as ophthalmic health manpower. The ratio of ophthalmologists is 1 per 1 million of population; and until recently there were none in Chad, Central African Republic, and Swaziland.

Most of the ophthalmologists in Africa are expatriates who are rendering curative and sight-restorative services in urban centers. In some countries, notably those in East and Southern Africa, eye-care services are being rendered by ophthalmic medical assistants, mainly at provincial and district levels.

The WHO project for the control of onchocerciasis in West Africa has registered satisfactory progress through its vector control

activities. However, the disease still presents a major public health problem in the untreated areas.

Trachoma remains a major problem in most countries of the region. Vitamin A deficiency is increasingly being acknowledged as a major cause of blindness in drought-affected countries of the Sahel as well as East and Southern Africa. The situation regarding glaucoma is not clearly known, but the phenomenon is already a major public health problem.

It is acknowledged that the highest rates of blindness in the world may be found in some countries of Africa; but this blindness could be prevented or cured through good hygiene, adequate food, vector control, safety measures, as well as early detection and treatment of eye diseases. Many countries are becoming aware of these and other measures, including the availability of technology for their prevention. Inadequacy of trained personnel constitutes a major constraint in the endeavor to formulate and implement realistic programs. Lack of finance and other resources is another major drawback.

The objectives of the WHO Program are:

1. To eliminate avoidable blindness.
2. To promote ocular health and provide essential eye care for all.
3. To reduce the national blindness rate to less than 0.5 percent, and to ensure that the rate in any given community is not more than 1.0 percent.

WHO Program activities are focused on the following areas:

1. Encourage formation of a national committee for prevention of blindness.
2. Support activities for collection and dissemination of data on blindness, including risk-inducing factors.
3. Formulate and implement national blindness prevention programs.
4. Participate in training programs for all categories of health worker, especially ophthalmic medical auxiliaries.
5. Produce and disseminate basic training aids for district and public health workers.

6. Mobilize funds and other resources in support of national programs for prevention of blindness and for research activities.

Let us take these activities one at a time:

1. **Encourage formation of a national committee for prevention of blindness.**

   Rapid implementation of action plans can be assured through the National Committee for the Prevention of Blindness. This coordinatory machinery is chaired by a senior public health administrator at the Ministry of Health. Its composition includes representatives from the faculty of medicine, other governmental institutions, and non-governmental organizations, including the national society for the blind.

2. **Support activities for collection and dissemination of data on blindness, including risk-inducing factors.**

   In 1981, WHO-supported surveys on blindness were carried out in Botswana, Ethiopia, Lesotho, Malawi, Swaziland, Togo, Zambia, and Zimbabwe. In 1983, a study was carried out in Niger on problems caused by blindness in relation to socioeconomic development in the country. In 1986, surveys were carried out in Burkina Faso and in Ethiopia. In 1986–87, a national survey was conducted in Togo, the results of which have been published in March 1989 in the weekly WHO epidemiological bulletin, No. 12, page 87.

   The results of a national survey carried out in the Congo in 1988 have indicated a national blindness rate of 0.3 percent, which is among the lowest in the African Region. On the basis of this survey, there was not a single case of blindness attributable to onchocerciasis.

   Also in 1988, WHO-supported surveys were also carried out in Botswana, Burundi, Central African Republic, Equatorial Guinea, Gabon, Lesotho, Mozambique, and Zaire. In 1989, surveys were made in Swaziland, Zambia, and Togo. In 1990, one survey was carried out in Benin.

   These surveys have stimulated efforts for the prevention of blindness to the extent that most countries are now aware of the problem and are taking preventive measures to the extent possible.

3. Formulate and implement national blindness prevention programs.

WHO Member States have called for resolute measures towards the integration of blindness prevention programs into community health services. The African Regional Office is already strengthening its efforts towards this direction through a three-phase scenario, and the program is accordingly being reoriented.

To date, only 17 countries of the region have formulated national programs for prevention of blindness: Botswana, Burkina Faso, Chad, Gambia, Ghana, Kenya, Lesotho, Malawi, Mali, Mauritania, Niger, Nigeria, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. These programs are under the management of the chief government ophthalmologist or another officer who is answerable to the Director of the Division for Disease Prevention and Control. At the central level his main responsibilities include the determination of priorities, mobilization and allocation of resources, provision of support at all levels of eye care, organization of training and health education programs, and monitoring and evaluation of program activities. He also promotes and coordinates epidemiological studies on blindness.

4. Participate in training programs for all categories of health workers, especially ophthalmic medical auxiliaries.

This program fosters the training of ophthalmic health personnel and must ensure their retention and equitable geographical distribution in the country. The ophthalmic nurse and medical assistant is the mainstay of primary eye care. In many African countries, they provide services at district and intermediate levels. Tertiary eye care is usually provided by qualified ophthalmologists. Only 12 countries have established training institutes for ophthalmic manpower. Training for ophthalmologists is currently available in Cote d'Ivoire, Kenya, Mali, Nigeria, Senegal, Tanzania, and Zaire. Ophthalmic medical assistants are being trained in Ethiopia, Kenya, Malawi, Mali, Nigeria, and Tanzania. Training of optometrists is available in Nigeria, and Tanzania is conducting training of assistant ophthalmic opticians.

In addition, the regional program for the prevention of blindness enjoys a very fruitful collaboration with NGOs supporting blindness programs. They have jointly organized several seminars and workshops as well as training and service-oriented activities.

In 1980, subregional workshops were held at Lilongwe, Malawi, and Accra, Ghana. In 1983, WHO supported the organization of a national symposium held at Ndola, Zambia. In 1984, a regional seminar was held at Moshi, Tanzania, followed by a subregional seminar in Kampala, Uganda. A task force for prevention of blindness was held at Brazzaville, Congo, in October 1986. During the same year, WHO supported the organization of a national seminar in Mauritania. A subregional seminar on prevention of blindness was held at Bujumbura, Burundi, in November 1987, followed by a regional workshop on manpower development for blindness prevention in Africa held at Accra, Ghana, in 1988. A similar seminar took place at Lome, Togo, in April 1990.

The support of WHO to the Lilongwe School of Health Science and the WHO Collaborating Center at the Institute of Tropical Ophthalmology (IOTA) at Bamako has been instrumental in bringing about favorable results attained in the training of the ophthalmic health personnel who now serve in several countries of the region.

Fellowships have been offered for training ophthalmic health personnel in institutes in Africa and abroad. Recent beneficiaries of this program are Chadian and Centrafrican medical doctors now undergoing postgraduate training in ophthalmology at Bamako, Mali.

5. Produce and disseminate basic training aids for district and public health workers.

Available technical information and documentation is currently being widely distributed. One such document that has attracted considerable interest is the poster on "Prevention of Blindness through Primary Eye Care." This poster is available in English, French, Portuguese, Swahili, and most recently in Hausa.

6. Mobilize funds and other resources in support of national programs for prevention of blindness and for research activities.

This program has been an important tool for the promotion of ocular health and for the provision of essential eye-care services in these countries. To this effect, WHO Member States are calling for the provision of resources that are beyond the capacity of WHO. The amount of funds allocated for blindness prevention

from country program budgets grew from zero in 1980–81 to $131,000 during the 1988–89 biennium. Although modest, this indicates the interest of the member states. The main source of extrabudgetary funds has been the Japanese Shipbuilding Industry Fund, which in 1988 provided $107,000 for prevention of blindness in the African Region. However, only $60,000 was provided last year.

Regular budget and extrabudgetary funds have been used to purchase drugs and equipment in support of community eye care in the region's countries. Recent beneficiaries of these projects are Central African Republic, Chad, Ghana, Mozambique, Niger, Uganda, and Zambia. The activities in the countries also depend to a considerable extent on the support of those nongovernmental organizations involved in the African Region. The importance of the role played by these NGOs is fully recognized and appreciated by the Member States and by WHO.

RECOMMENDATIONS

The following are among the most salient recommendations:

1. Program activities should be reoriented and developed in line with a three-phase scenario for health development.
2. The need and importance of community health workers, ophthalmic medical assistants, and nurses must be considered of the utmost importance in the countries of the region.
3. There is a need for developing more training centers for ophthalmic medical assistants and nurses that are open to all the other countries of the region.
4. Those countries that have not done so should be stimulated towards establishing national programs for prevention of blindness.
5. There is a need for assisting and supporting countries to carry out more national surveys on the situation and trends of blindness.
6. There is a need for establishing one or two more WHO Collaboration Centers for Prevention of Blindness. It is noted that the Institute of Tropical Ophthalmology at Bamako (IOTA) is the sole WHO Collaborating Center for Prevention of Blindness in the African Region.

5

National Program Development: Resources Mobilization and Management

Dr. K. Kagame

Every country needs an effective national committee for prevention of blindness to formulate a marketable national program. It is a widely believed that a well-written proposal cannot fail to get funding.

PROPOSAL FORMULATION

A national program is a Ministry of Health document comprising many mini-projects that the Ministry uses to solicit funds from the government's treasury and from external sources. A national committee for prevention of blindness, using its flexibility to avoid unnecessary bureaucracy, is in a better position to market the mini-projects to international donors. Most donors now require project proposals that include detailed budgeting. Although in most eye-care programs, ophthalmologists are often required to produce these proposals, most of us are hopelessly ill-prepared for such a task. I have witnessed delays and cancellations of proposed projects because of shortcomings in ophthalmologists. In Uganda, we have been struggling with a document on onchocerciasis for the past four years—while the disease continues to take it toll.

I propose that we eye-care workers aggressively seek help from local professionals in the business-planning sector. We can then apply for technical assistance from WHO and other international agencies to complete our plans. However, I also call upon WHO and those international agencies to intensify their efforts in training our local eye-care project managers in managerial skills.

SOURCES OF RESOURCES

Internal Sources

Where a national eye-care program exists, its budget is likely to be incorporated in the national budget. That source is important because sustainability of programs depends on it. It is also important because when supplementary funding has to be sought from international donors, that local effort is a favorable influence in determining whether the donor will fund a project or not. Ministries of health require departmental budgets to make their budgetary application to the national treasury. But once the funds are allocated, they need these departments to apply for them to implement their projects. A well-organized program helps the ministry both to get funds and to spend its allocation.

In Uganda, last year's Auditor General's report was critical of ministries for not spending their allocations. Perhaps with this as a contributory factor, the Ministry of Health's budgetary allocation has shrunk from 10 percent to 4 percent over the last decade.

On a more positive note, over the last year, we have strengthened our national committee for prevention of blindness, and the formulation of a national program is nearly complete. We hope to help the Ministry of Health mobilize resources and utilize them appropriately.

External Sources

Recourse to international aid is supplementary and temporary. It is most important in getting projects through the initial costly phase especially when it is necessary to fund capital development. Successful application for funding is helped by:

1. Having an effective national committee for prevention of blindness to negotiate for this aid and give the donor confidence that programs will be implemented as planned.
2. Having a well-documented national program that includes the project for which funding is being sought.

PART 3

PLENARY SESSION II

IAPB Regional Progress Reports

WORLD BLINDNESS AND
ITS PREVENTION
VOLUME 4

1

Regional Progress Report: East, Central, and Southern Africa

Dr. Moses C. Chirambo

The countries constituting the East, Central, and Southern African Subregion are Angola, Botswana, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.

The prevalence of blindness in the subregion, which has a population of about 160 million, is estimated at 1.2 percent. There are about 2 million blind people and another 2 million who have severe visual impairment.

These prevalence rates have been confirmed by national population-based surveys carried out in Kenya, Malawi, Zambia, and Ethiopia. The major causes of blindness in the subregion are cataract, trachoma, glaucoma, and xerophthalmia. Blindness from cataract represents over 50 percent of all blindness cases.

Blindness can be prevented or cured through proper hygiene, proper food, adequate safety measures, and early detection and treatment of eye diseases. However, the scarcity of ophthalmologists, ophthalmic nurses, and ophthalmic assistants constitutes a major constraint on these endeavors.

In the subregion, the available number of ophthalmologists is estimated to range from 1 per 1 million of population in Tanzania to 1 per 2 million in Malawi. Only four out of 13 countries, Kenya, Tanzania, Ethiopia, and Uganda, have established training institutions for ophthalmologists. Moreover, the output of ophthalmologists from these institutions is inadequate to meet the African Regional target of 1 ophthalmologist per 500,000 of population. To overcome these constraints, policies have been reviewed to give special emphasis to the training of ophthalmic assistants.

One of the most remarkable features of the international NGOs for the blind working in the subregion has been the shift from providing only services to providing manpower development assistance

as well. The main thrust during the period under review has been the establishment of training programs for ophthalmic assistants.

The Southern African Subregional Ophthalmic Training Center's Regional Eye-Care Training Program in Lilongwe, Malawi, trains ophthalmic assistants from all parts of the subregion. To date 135 ophthalmic assistants have undergone training at the Center. The ongoing national training programs in Ethiopia, Kenya, Mozambique, and Tanzania have also continued to train ophthalmic assistants. In 1989, Sight Savers in collaboration with the Uganda Ministry of Health, established a national training program for ophthalmic assistants. Furthermore, Lesotho and Zimbabwe are at an advanced stage of establishing national training programs for ophthalmic nurses, with support from Sight Savers and Norwegian NGOs respectively.

Other major achievements include the development of national programs, and the NGO support of these programs. Five members states in the subregion, Botswana, Lesotho, Mozambique, Swaziland, and Zambia, collaborated with the WHO in the collection of data on the causes and distribution of blindness and the formulation of national programs. Almost all countries in the subregion have formed national committees for the prevention of blindness.

The WHO and international NGOs, in collaboration with ministries of health, have organized several meetings that have proved useful particularly for the discussion of experiences. On May 25–29, 1987, Christoffel-Blindenmission and Sight Savers organized a meeting in Togo for the trainers of eye health personnel; on February 25–26, 1988, the Zambia Ministry of Health, in collaboration with the IDRC of Canada, organized a seminar on eye diseases in Africa and also disseminated the results of the Luapula Valley survey of 1985. During March 9–10, 1988, the second meeting of the Consultative Group of NGOs to the WHO Program for the Prevention of Blindness took place in Nairobi, Kenya, to discuss developments of both global and regional impact that are related to the work of the WHO program as well as NGO support of the IAPB.

On July 5–8, 1988, the WHO organized a workshop in Accra, Ghana, on Manpower Development for Blindness Prevention in Africa that focussed on the role of eye health workers at all levels in relation to training and service needs within primary health-care systems.

From December 1988 to March 1989, the WHO commissioned

short-term consultancies to Botswana, Lesotho, Mozambique, Swaziland, and Zambia to collect data on blindness, training needs, and formulation of programs. During October 24–28, 1989, the Tanzania Food and Nutrition Center organized a meeting on vitamin A deficiency and xerophthalmia to discuss national and regional control strategies. From June 24–26, 1990, the Zambia Ministry of Health with Helen Keller International organized a workshop on Vitamin A deficiency and xerophthalmia for the African Region to review national and regional control strategies.

In addition to regional meetings, two inter-regional meetings took place. One on corneal blindness within primary health-care systems was held in Tunis, Tunisia, during November 14–18, 1988. The meeting reviewed data on corneal blindness, pathways to corneal blindness, preventive strategies, and role of community participation and health education.

The twelfth IVACG meeting was held in Addis Ababa, Ethiopia, from December 7–11, 1987. During September 25–29, 1989, the East-African Health Community and the West-African College of Surgeons hosted a subregional workshop on prevention of eye diseases and blindness in Banjul, Gambia, to develop African Regional control strategies.

These meetings have resulted in a consensus on priorities for prevention of blindness in the subregion. Of the 13 countries in the subregion, only two have not yet developed national programs. It is particularly noteworthy that the involvement of international and national NGOs, including service clubs, is of great importance in the African Regional setting, where the scarcity of resources within the health sector is becoming more and more serious as a result of economic recession.

In conclusion, the main challenge in the future for prevention of blindness in this subregion is to continue strengthening national programs. This will require further support from both local and international NGOs.

2

Regional Progress Report: West Africa

Drs. Daniel Etya'ale and Nicolas Toufic

BACKGROUND

The West-African Subregion is a heterogenous area with two very distinct subgroups: French-speaking West Africa and English-speaking West Africa—and the difference goes far beyond merely the speaking of two different languages. Despite these differences, the two subgroups share the following:

1. A high prevalence rate of blindness, over 1.0 percent in many areas, with half of these cases of blindness due to cataract, plus endemic (and in some parts hyperendemic) onchocerciasis, which sweeps the entire subregion.
2. An extreme shortage of ophthalmologists (about 1 ophthalmologist to 1.5 million inhabitants). This shortage is made even worse by the fact that most ophthalmologists live and work in big cities and not all are capable of performing successful cataract surgery.
3. Inadequate or nonexistent structures at the national level to initiate, promote, coordinate, and supervise the implementation of policies and programs pertaining to the prevention of blindness.
4. A worsening economic crisis that severely limits existing funds and makes the new reallocation of funds very difficult, if not impossible.

ACCOMPLISHMENTS

Collection of Basic Data

A great effort is being made in many parts of West Africa to arrive at a more realistic prevalence rate of blindness.

In 1988, national population surveys were carried out in Togo and in the Congo. In other countries, such as the Central African Republic, Chad, Gabon, and Zaire, surveys were more limited in their scope. However, from these surveys, the prevalence rate was estimated at 1.2 percent and the five most common causes of blindness were found to be, in order: cataract, onchocerciasis, trachoma, glaucoma, and Vitamin A deficiency.

Establishing a National Committee for the Prevention of Blindness

An increasing number of West African countries have established blindness prevention programs. The Gambia, Sierra Leone, Ghana, Mali, and others are currently in the process of establishing such programs. Preliminary studies have been completed in Togo and a national consultation meeting is being convened in Cameroon for early January, 1991.

Introduction and Widespread Distribution of Ivermectin

Ivermectin, not yet the ideal drug to combat onchocerciasis, is nevertheless a giant step in the right direction. To date, over 150,000 doses have been distributed within the Onchocerciasis Control Program (OCP) region. Because of the tolerance that has been recorded, mass distribution is recommended.

Manpower Development

The severe shortage of ophthalmologists in the West-African Subregion remains one of the major obstacles to effective blindness prevention programs. The present situation of too few ophthalmologists is likely to continue for many years and the target of 1 ophthalmologist per 200,000 inhabitants still remains a distant dream. We hope that this unfortunate situation will be improved using lessons learned from experiences in training ophthalmic personnel in East Africa.

Progress in the field of manpower development has been made in two main directions. First, two consultations have been convened, one for English-speaking West Africa in Accra, Ghana, in July 1988, and one for French-speaking West Africa in Lome, Togo, in April 1990. Both meetings were conducted with a deep commitment and resolve to train different categories of ophthalmic personnel. As

a result of the Accra meeting, two training programs for ophthalmic nurses have been established with the Ministries of Health in Ghana and Sierra Leone. In the Francophone area, the Institute of Tropical Ophthalmology in Bamako, Mali, has been reorganized and now offers a four-year training course for ophthalmologists and a one-year course for ophthalmic nurses.

Secondly, since 1988 regular in-service training courses varying in length from three weeks to three months have been conducted in Burkina Faso, Cameroon, Chad, The Gambia, Ghana, Sierra Leone, and Zaire. These courses have been run entirely by NGOs, particularly Christoffel-Blindenmission.

Other recent events in the West-African Subregion include: the Fourth Congress of the Pan African Society of Ophthalmology in Bamako, Mali, in November 1988; the creation of the Central African Ophthalmology Society in March 1989 (a special report, entitled "Prevention of Blindness in Inter-tropical Africa," which Dr. Nicolas Toufic presented at this meeting is available from Dr. Toufic); and a meeting of the Organization for the Prevention of Blindness in Mali (Yeelen) in May 1990.

CONCLUSION

Something very concrete is taking place in West Africa in the important area of blindness prevention. Significantly, this is not the result of a few isolated private initiatives, but rather it derives from a series of concerted efforts. These efforts must be sustained, encouraged, and better-channelled to further increase efficiency and reduce cost. Assuredly, one of the greatest challenges in the coming years will be to identify, train, and motivate key persons at the national level to play the important role of catalyst.

3

Regional Progress Report: Peru, Bolivia, Ecuador, Colombia, and Venezuela

Dr. Francisco Contreras

Central and South America constitute a developing subcontinent covering 21 million square kilometers with 450 million inhabitants in 37 countries; 32 percent of the population is rural and 68 percent is urban. The income rate is $1,820. There are 12,000 ophthalmologists. Unfortunately there is an unequal distribution of both human and financial resources.

Since the last IAPB meeting in New Delhi, several NGOs such as Helen Keller International (HKI), Operation Eyesight Universal (OEU), Christoffel-Blindenmission (CBM) and the International Eye Foundation (IEF), have given technical and/or financial support to the Prevention of Blindness Programs in different countries of the region. We would also like to mention successful vertical programs, such as Cataract-Free Zones, which have been developed thus far in nine Latin American countries.

In Andean countries, the activities of ocular health and prevention of blindness that are conducted through the National Health System, are supported by HKI, OEU, and Project Orbis. The Pan-American Association of Ophthalmology is playing an increasingly important role through its Prevention of Blindness Committee.

In Peru, a medium-term action plan is being executed with the following eight components:

1. Manpower development and training of personnel.
2. Training of primary health workers.
3. Training of supervisory nurses.
4. Training of general practitioners.
5. Training of one ophthalmologist in public health at the tertiary level.
6. Implementation of health services by providing minimum

equipment and medicines to the first and secondary levels; in addition, a low-cost spectacles assembly workshop is in its pilot project phase.

7. In operations research: The Cataract-Free Zone projects are in their expansion phase. After the experience in Chimbote, Peru, and Campinas, Brazil, two new Cataract-Free Zone projects were performed in Peru, one on the coast in Ica and another in the jungle in Iquitos. Both are currently in the evaluation phase.
8. In epidemiologic research: With the technical assistance of Operation Eyesight Universal, we are in the planning phase of a vitamin A deficiency prevalence survey. The objective is to state the magnitude of the problem in order to develop future intervention strategies. We are also spreading information through a Spanish bulletin edited with the support of Project Orbis and Operation Eyesight Universal. The purpose of this summary is to disseminate information about prevention of blindness programs that have been developed in our region.

A significant blindness problem exists in Latin America with a great opportunity to mobilize available resources of manpower and technology to combat it. Generally, the governmental national health programs are orientated to mother-child programs or to conditions with high mortality rates. However, with the interest and participation of different non-governmental organizations, committees of the National Societies of Ophthalmology and the Pan-American Association of Ophthalmology, many programs have been started and others are being planned in Latin America.

4

Regional Progress Report: Argentina, Uruguay, Paraguay, and Chile

Dr. Eugenio Maul

The one necessary component of all blindness prevention programs is the ophthalmologist. However, in most countries of South America the interest in blindness prevention among ophthalmologists has been low. Traditionally the ophthalmologist has been busy performing research to improve our understanding of eye diseases, developing new drugs, or taking care of patients. However, the contribution of such activities toward the prevention of blindness is limited. It is from their involvement in public health that ophthalmologists become more productive in the field of prevention of blindness.

The following are prevention of blindness meetings stimulated by my IAPB activity in the southern cone of South America:

1. A seminar on blindness prevention strategies in Chile was held to inform clinical ophthalmologists and motivate them in the field of prevention. It was attended by 192 ophthalmologists—nearly 60 percent of all those in Chile. Major causes of blindness were discussed and Dr. Caraxo from PAHO lectured on the concept of visual health status.
2. The first Argentina meeting on Sanitary Education, Prevention, and Rehabilitation of the Blind was held in 1987 during the XIII Congress of Ophthalmology in Cordoba.
3. The first meeting in Uruguay on prevention of blindness was held in December 1991, during the Congress of Ophthalmology in Punta del Este.

BLINDNESS PREVENTION COMMITTEES

In Argentina, Uruguay, and Chile, prevention of blindness activity has originated mainly from prevention of blindness committees

within the national ophthalmological societies. These departments have been very active in promoting many prevention activities and also in educating the local ophthalmological community. In Paraguay a section in the Ministry of Health promotes primary eye care as a way to prevent blindness.

EPIDEMIOLOGICAL AND CLINICAL RESEARCH COURSES

This activity sponsored by national ophthalmological societies has been directed by Dr. Carl Kupfer with the collaboration of scientists from the United States and Latin America. Three-day courses to a group of 40–50 selected ophthalmologist were given in Argentina, Brazil, and Chile. These courses have been instrumental in epidemiological research related to prevention of blindness. A flow of papers on causes of blindness, outpatient consultation, and blindness in children has followed these courses.

PRIMARY EYE CARE

Two studies related to this field, one in Chile funded by a grant from PAHO and another in Paraguay funded by AGFUND/PAHO are giving important information related to primary eye care as a strategy to prevent blindness in this area. Both are using the structure of the existing primary health-care system. Besides providing first aid to eye patients, it improves the accessibility of the patient to eye services. The study in Chile, which is now finished, was conducted in part in a rural setting and in part in a suburban population, where the primary health physician received primary eye-care training. They were able to resolve 55–65 percent of primary eye consultations, and of those referred to the ophthalmologist 80 percent of the cases were referred correctly. These results stress the role of primary eye care in blindness prevention.

DELIVERY OF EYE CARE

Several institutions provide eye care through programs supported by local and also foreign organizations. "Corporación de ayuda al

limitado visual" in Concepción, Chile, provides secondary and tertiary eye care with the important support of Christoffel-Blindenmission.

OPERATIONS RESEARCH IN PREVENTION OF BLINDNESS

Dr. Carl Kupfer, Director of the National Eye Institute in Bethesda, Maryland, supported the hypothesis that cataract is the main cause of blindness in Latin America. This idea was carried on by the Pan-American Association of Ophthalmology and Helen Keller International to successfully demonstrate in the two initial Cataract-Free Zone projects in Peru and Brazil that cataracts are indeed the most important cause of blindness in the region. In the second phase, 10 projects were initiated, and three of them have been completed, two in Chile (one in a rural area and another in an urban area) and one in Uruguay. These three projects were able to replicate previous findings that half of the blindness in these countries may be cured by a cataract operation.

These projects have been also important for motivation of the ophthalmological community and have also served as a demonstration for health authorities, who are often busy with other problems, such as childhood mortality, which are of the magnitude and importance of blindness. Cataract-Free Zone projects can also prove that much can be done using existing facilities and human resources.

LIONS' SIGHTFIRST PROGRAM

The impact of the cataract program has been great. As a consequence, recently the SightFirst Program, an initiative in prevention of blindness by the International Associations of Lions Clubs, has considered cataract blindness a priority and has launched a series of projects in Latin America that includes Mexico, Venezuela, Colombia, Ecuador, Peru, Chile, Uruguay, and Argentina. These projects will include treating the cataract blind and providing eyeglasses to those persons who will benefit.

Epidemiological data on prevention of blindness have also been a product of these activities. It is clear that for countries like Argentina, Chile, Paraguay, and Uruguay the principal causes of blindness are cataract, glaucoma, diabetic retinopathy, other retinal

disorders, and trauma. Childhood blindness in these countries is due to prenatal causes in 60 percent of the cases. Such information is of foremost importance for future activities in the field of blindness prevention.

Finally, I wish to recognize the support of Merck Sharp and Dohme, Chibret International in my activities as Co-chairman for South America (Argentina, Chile, Paraguay, and Uruguay).

5

Regional Progress Report: Central America

Dr. Fernando Beltranena

The Central American Subregion includes seven countries: Guatemala, Belize, Honduras, El Salvador, Nicaragua, Costa Rica, and Panama. Except for Belize (officially English), all are Spanish-speaking countries. In addition, there is a large population in Guatemala who speak Indian languages, making communication sometimes difficult.

GEOGRAPHIC OVERVIEW

Central America forms an arc between the Yucatan Peninsula and South America. It is a corridor between two continents and holds a convenient passage between two oceans. Nature divided the land into warm lowlands and cool mountain uplands. The climate allows a wide variation of vegetation, from mangrove swamps to pine groves and from savanna to rain forest.

Central America presents a mosaic of peoples: Indians with language and customs inherited from their pre-Columbian ancestors, descendants from the Spanish conquistadors, and immigrants from Europe and other places. Its area is 5,227,650 square kilometers and its population is 25,300,000.

Unfortunately, political turmoil in some of the Central American countries makes data collection very difficult. Reports on activities on prevention of blindness in each country are scarce and sometimes impossible to get.

Prevention of blindness activities have been important in Guatemala for a long time. Guatemala is a small country with an area of 109,000 square kilometers.

The country is divided into 22 departments and 328 municipalities or counties. It has a population of 9.6 million, 45 percent of

whom live in urban areas and 55 percent of whom live in rural areas, with a population density of 88 per square kilometer. The crude birth rate is 40 per 1,000, and the fertility rate shows that the average woman has five or more children. Guatemala has a per capita income of $100 per year. Inflation has risen 100 percent in the last year. The public health budget is 8.7 percent.

BLINDNESS AND OCULAR MORBIDITY SURVEY

A survey, made in the highlands in 1986 with the joint efforts of the World Health Organization and the National Committee for the Blind, showed the following data: visual acuity of less than 20/400 (0.11 percent), acuity of less than 20/200 (2.00 percent), and acuity of less than 20/100 (7.11 percent).

Data regarding the etiology of ocular morbidity showed the following: trachoma (36 percent), refractive defects, including amblyopia (22 percent), cataracts (21 percent), retinal disease (9 percent), corneal opacities (7 percent), and glaucoma (5 percent).

ONCHOCERCIASIS

Data on onchocercosis in Latin America shows: Guatemala (40,000 cases, 600 blind), Mexico (24,000 cases, 100 blind), Venezuela (20,000 cases, 100 blind), and Ecuador (7,000 cases, 100 blind). In Guatemala, onchocerciasis is primarily distributed in the zones on the south slope of the mountain chains between 1,000 and 5,000 feet. These zones are forest-covered areas of coffee plantations with high trees that give adequate shade to the plantation. Small rivers and mountain streams provide breeding sites for the transmitting flies.

Since Dr. Azis studied the microfilaricidal effect of Ivermectin in 1982, careful follow-up studies in Africa and Guatemala have shown the efficiency and safety of the drug for human use. In 1988, the Onchocerciasis Department of the Ministry of Health of Guatemala, headed by Dr. Guillermo Zea-Flores, started a pilot study in a population of 3,000 skin-positive and nodule-positive patients. Their results showed not only the safety of the product, with only 25 percent experiencing light to moderate reactions, but also the feasibility of stopping transmission by giving a simple dose of Ivermectin every six months instead of once a year.

The Dr. Rodolfo Robles Eye Hospital of the National Committee

for the Blind and Deaf, in association with the International Eye Foundation, and with the financial support of the Public Welfare Foundation, and in coordination with the Ministry of Health, started the first mass-distribution project of Ivermectin in the Western Hemisphere in 1990.

The area assigned by the Director of the Onchocerciasis Division of the Ministry of Health was the Yepocapa Municipality, an endemic area of 71 villages or specific locations in the Department of Chimaltenango. It had a target population of 19,000 inhabitants and an eligible population of 12,000. We have followed the recommended exclusion criteria: pregnant women, lactating women within one month of delivery, weak or seriously ill persons, and small children (under 15 kilograms of weight) are not allowed to participate.

As of October 1, 1990, we had given the Mectizan dose to 8,500 persons. We have covered 80 percent of the targeted population. By the first week in December 1990 we will have finished with the last village. From the projection that we have been able to make, we believe that the ultimate coverage will be over 85 percent of the population.

A motivated population, in addition to the nodulectomies, can contribute to positive results. The International Eye Foundation has already requested funds for the second-year of treatment. We intend to involve the health promoters of the area to increase the treatment in nearby localities and extend our coverage to some 25,000 patients. The program in Yepocapa has funding for up to three years. We will rely on local resources to continue the Ivermectin treatment if international funds become unavailable. This program also requires the availability of the drug from Chibret International.

For the last three years, Ciba has been conducting clinical research with their onchocercacide drug CGP 6140 in Ecuador and Guatemala. In Guatemala the Dr. Rodolfo Robles Hospital has provided the territory used for the drug trials. Amocarzine (CGP 6140) is a colored agent developed as an oral microfilaricide. It also possesses good microfilaricidal properties when used in humans. The drug is given after meals in a regimen of three mg/kg twice a day for three consecutive days. It has been shown that postprandial administration provides higher and more regular plasma levels. [1]

TRACHOMA PROJECT IN GUATEMALA

The Blindness and Ocular Morbidity Survey in Guatemala showed that in 1986 trachoma represented 7 percent of the pathology found in the highland population. Through the initiative and partial funding of the WHO, we have finished the third phase of a program to train health personnel in the new Simplified Grading System for Trachoma. We started the project in November, 1989, and have covered three departments and a total population of 671,000 people. We have had the full cooperation, coordination, and integration of personnel from the Ministry of Health. We have trained 45 physicians and directors of health centers, 75 health technicians, and 580 voluntary community-based health promoters. After receiving reports from the endemic areas, we have been able to deliver terramycin ointment donated by Christoffel-Blindenmission.

Reports from the Solola area show that more than 5,000 cases of mostly follicular, inflammatory, or scar trachoma have been detected. Epidemiological reports from the health promoters and technicians are still coming. The facts shown on these reports have caused the head of the Solola area to reconsider the official view of trachoma and to include this disease among the priorities of the health authorities in the area.

VITAMIN A PROGRAM

Nutritional studies by INCAP (Central American Institute of Nutrition), CESSIAM (Investigative Branch of the National Committee for the Blind, and the Dr. Rodolfo Robles Hospital) show a high degree of malnutrition and hypovitaminosis A of the population in Guatemala. This is a national problem necessitating the mobilization of a multi-institutional intervention program.

The National Commission for Vitamin A was created with the participation of UNICEF, INCAP, the Ministry of Health, the National Committee for the Blind, the National University of San Carlos, and AZAGUA (Sugar Mills Association of Guatemala). This committee has been working since 1988 to carry out a program in three phases to reduce the hypovitaminosis A in children under six years of age. The target population constitutes 6 million children.

Phase one of this program includes delivery of a prophylactic dose of 200,000 units of Vitamin A per child to a wide range of the population. Phase two seeks to fulfill the goals of sugar for-

tification. Finally, and most importantly, phase three attempts to increase production and consumption of carotene-rich foods by the population.

CESSIAM has been performing research on several aspects of the nutritional status of the population and nutrient trials (including vitamin A trials) in some areas of Guatemala.

RESIDENTS IN OPHTHALMOLOGY PROGRAMS

Guatemala is the only country in Central America where a full university-endorsed resident training program exists. There are two programs, the first is government and state financed and endorsed by San Carlos University at the Roosevelt General Hospital. The second is a program of the Dr. Rodolfo Robles Hospital and is endorsed by Francisco Marroquin University, a private Institution. There are 36 residents in both programs. Both residency programs provide scholarships for foreign residents. Colombia and Ecuador have the largest populations of resident alumni of the Guatemalan programs. From Central America there are residents of Belize, Honduras, El Salvador, and Nicaragua.

Since 1988, groups of about 300 medical students have been trained in primary eye care in an eight-hour course delivered at the Dr. Rodolfo Robles Hospital. The students attend the course prior to rotating through the health clinics and centers that the Medical School of the University of San Carlos maintains in rural and poverty-stricken areas.

HEALTH PERSONNEL TRAINING

Physicians, nurses, health technicians, and health promoters, totalling more than 600, have attended the primary eye-care courses provided in rural areas by the Dr. Rodolfo Robles Hospital. In the area of surgical and medical ophthalmology for nurses, fifty students from the National Nurse School have received a year of training, which includes courses in primary eye care.

NGOs IN THE PREVENTION OF BLINDNESS IN CENTRAL AMERICA

The International Eye Foundation, which has several projects and

programs in Guatemala, Honduras, and Belize, has implemented an Eye Clinic in Santa Rosa, Honduras, and also in Belmopan. Mass distribution of Ivermectin in association with the National Committee for the Blind is taking place in Guatemala, and nutrient distribution to school children in three rural areas is ongoing in association with the NCFB. In addition, scholarships for ophthalmologists help provide eye care to the area of Santa Rosa in Honduras.

Christoffel-Blindenmission, which has given equipment and instruments for eye surgery, direct aid to poor patients, visual aids, and therapeutic contact lenses to Guatemalans, also has provided 20,000 tubes of terramycin for the trachoma program at the Dr. Rodolfo Robles Hospital of the NCFB. Vision for the Americas, Inc. has donated equipment and instrumentation to the National Committee for the Blind in Guatemala and has helped to establish eye clinics. In addition, Project Orbis has conducted hands-on teaching for residents in ophthalmology and has donated drugs and teaching visual aids.

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Regional Progress Report: North America

Mrs. Virginia Boyce and Mr. John M. Palmer, III

North America includes the nations of Canada and the United States, and has a combined population of 300 million. There are 15,000 ophthalmologists in the region, providing a ratio of 1 ophthalmologist for every 20,000 people.

It is estimated (East Baltimore Survey) that in North America there are 1 million blind persons resulting from the following causes:

1. Unoperated Cataract. (As in other places, despite huge increases in cataract operations, there is an uneven access and utilization of care; cataract is responsible for 30 percent of all blindness in Blacks.)
2. Open-angle glaucoma in the Black population and age-related macular degeneration in Whites.
3. Diabetic Retinopathy.

The immediate challenges in blindness prevention in North America are:

1. To make cataract surgery accessible and usable by all who need it. Not only blindness should be eradicated, but also visual impairment (worse than 20/40), so that people can read comfortably, retain their jobs, and have regular drivers licenses.
2. To develop better methods of identifying people with glaucoma. Only one half of those who have glaucoma presently know it. We must identify them before they inevitably become blind. Target screening should be performed for the highest risk groups: Blacks, the elderly, and those with a positive family history.
3. To make certain all diabetics receive annual eye examinations, and to treat visual impairing and blinding retinal changes. Therapy is very effective, but people need regular examinations.

Although this report briefly summarizes conditions within the North American region, our focus is primarily directed outside Canada and the United States.

During the past quadrennial, the North American region has reconstituted itself and enlarged its membership. International nongovernmental organizations included are: Seva; The International Eye Foundation; Project Orbis; Helen Keller International; Sight Savers; Combat Blindness, Inc.; and Christoffel-Blindenmission, USA. In addition, we look forward to welcoming the River Blindness Foundation in the near future. The American Optometric Association, the American Academy of Ophthalmology, the Pan-American Association of Ophthalmology, and the International Vitamin A Consultative Group are also represented at regional meetings, as are links with WHO Collaborating Centers such as the National Eye Institute at the National Institutes of Health and the International Center for Epidemiologic and Preventive Ophthalmology at the Johns Hopkins School of Hygiene and Public Health.

The North American Subregion has met annually at the National Institutes of Health for the purpose of information sharing, planning, and support. Of special note, the subregion co-hosted a major conference on blindness prevention with emphasis on cataract surgery in conjunction with the tenth Anniversary of the World Health Organization's Prevention of Blindness Program.

The focus of the North American Subregion is to develop effective strategies for supporting and expanding blindness prevention activities in the field. To do this, we are achieving new levels of collaboration and cooperation which include a newly established computer-linked communications system (with assistance from the American Academy of Ophthalmology) that builds towards more efficient use of commodities and gifts-in-kind and collaborative interagency programming. This has been most recently illustrated by the formation of a North American consortium to address the disastrous effects of river blindness.

Looking to the decade of the 1990s, we are challenged to achieve new levels of support for the expanded program opportunities before us and to design even more effective strategies for achieving the improved and sustainable impact of those local and national programs with whom it is our privilege to collaborate.

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Regional Progress Report: Eastern Mediterranean

Sheikh Abdullah M. Al-Ghanim

INTRODUCTION

I have the pleasure and honor to participate in the IAPB Fourth General Assembly, which represents a new constructive and serious step in coordinating and integrating the control and prevention of blindness. This gathering, I believe, will be an excellent opportunity for specialists and persons concerned with protecting vision to exchange views and experiences and discuss scientific and human aspects pertaining to this subject.

I would like to extend my heartfelt thanks and appreciation to the Republic of Kenya for hosting this conference and to Dr. Carl Kupfer for his kind invitation to participate and speak at this important Assembly. On this occasion, I should express my appreciation of the IAPB's active contribution to the prevention of blindness and the control of eye diseases all over the world. We are extremely proud of the excellent work of this Agency.

This report will deal with different subjects, achievements, and aspects concerning the prevention of blindness in this region. To portray a clear picture on these issues, it may be useful to divide this report into different sections.

MAGNITUDE OF THE PROBLEM OF BLINDNESS

Blindness continues to be a major health and social problem in most countries of the Eastern Mediterranean Region. But despite this fact, until now, it has not been possible to estimate accurately the number of blind persons in the region, both because information is lacking and because each country defines blindness in relation to its own social and economic conditions. Therefore, the magnitude of the

problem is still not know in its details and dimensions. This scarcity of data causes major difficulties encountered in the region.

However, according to the statistics available in this field, a rough estimate for the region would be 8 million blind people in 1990. More than 75 percent of blindness in the countries of the region is believed to be preventable. This represents a region-wide prevalence rate of about 2.5 percent. According to some investigations, it is estimated that most national prevalence rates have now become about 1.0–2.0 percent, as a result of improved health care and health services, especially in the field of eye-care systems and prevention of blindness in many countries of the region.

In areas of the region free from trachoma, onchocerciasis, and other acute eye problems, the prevalence of blindness is less. Rates may vary from 0.86 percent in such areas to 4.2 percent in those places where such causes are endemic. In accordance with estimations and statistics, we have received recently from some countries in the region. The blindness rate in Saudi Arabia is 1.5 percent, in Iraq it is 1.0 percent, Qatar has 1.8 percent, Jordan has 1.6 percent, Egypt has 1.8 percent, and Tunisia has 1.9 percent. In the Arab Gulf Area, the blindness percentages fluctuate between 1.0 percent and 2.0 percent. However, in rural areas the percentage may be higher.

These figures indicate the serious magnitude of the problem of blindness, which necessitates joint efforts for the control of blinding diseases as well as the need for the provision of an intensive program of education, rehabilitation, and employment. Although most of the countries in the region have made great efforts to prevent unnecessary blindness, unfortunately the problem is still severe. This is in our opinion due to the following reasons:

1. Delay of ophthalmological attention and care for patients suffering from eye diseases.
2. Lack of a practical program for prevention of blindness, as well as a national policy for the control of communicable eye diseases.
3. Lack of accurate and up-to-date statistics.
4. Lack of skilled medical manpower.
5. Lack of specialized ophthalmological services, especially in remote and rural areas.

MAJOR CAUSES OF BLINDNESS

Causes of blindness in the Eastern Mediterranean Region appear nearly similar to those in the other regions in the world. They are as follows:

Trachoma

Trachoma is still considered one of the principal causes of blindness in the region. About 150 million people are liable to be afflicted by eye diseases, especially trachoma. More than 60 percent of these cases could be prevented by good hygiene and early treatment. The majority of preventable cases occurs in children. Although vigorous national efforts have been exerted in many countries of the region over the past several years to eradicate this eye disease, trachoma is still not under control.

Cataract

Cataract is also one of the leading causes of blindness in many countries of the region, especially among old people. As the aging population increases, cataract is going to be the major target for prevention of blindness programs in the Kingdom of Saudi Arabia. Cataracts are already responsible for 55 percent of the blindness in the Kingdom.

Trauma

Trauma is the most important preventable cause of blindness among school-age children in all countries of the region. In agricultural areas even minor injuries to the cornea may lead to blindness by infection. Prevention of minor injury is therefore important to prevention of blindness. In addition, special attention should be given to the rapid industrialization occurring in the region during recent years because such development often leads to increased workplace accidents that cause blindness.

Other Causes

Other causes of blindness are attributed to glaucoma, car accidents, conjunctivitis, onchocerciasis, and refractive problems. Among other

causes of blindness in some countries of the region, complications resulted from abuse of dangerous drugs without medical consultation or supervision, plus complications resulting from the use of popular prescriptions in treating or beautifying the eyes (e.g. Al-Kohl) according to the unhealthy social customs which we must eliminate from the region.

SUGGESTED PROGRAM FOR PREVENTION OF BLINDNESS

Although great efforts have been exerted by most of the region's countries, prevention of blindness is still surrounded by many serious problems. The Eastern Mediterranean Region recognizes that these problems cannot be solved by individual actions, but require cooperation, coordination, and collaboration. The critical need is to formulate a general program for prevention of blindness in each country at the national level.

ACTIVITIES OF THE EASTERN MEDITERRANEAN REGION IN THE FIELD OF PREVENTION OF BLINDNESS

I am pleased to review in brief some activities carried out by the Eastern Mediterranean Region in the field of prevention of blindness since the Third General Assembly of the IAPB in New Delhi, India, in December 1986.

Since its establishment, the Eastern Mediterranean Region has been intent on investigating effective methods and techniques of control and prevention of blindness in the Middle East. It has worked ceaselessly to halt the widespread prevalence of eye diseases, especially those in remote areas where there is a lack of appropriate medical services. It has encountered the problem of eye diseases and their consequences and affirmed the necessity to prevent them. Therefore, it has exerted all efforts to prevent blindness and urged all of its members in the region to collaborate with IAPB and WHO and with national organizations in the development of practical action for saving and restoring sight. We have continued our cooperation and coordination with such local and world organizations to eliminate the chief causes of blindness in the region, and we have brought experts and specialists to conduct surveys on eye diseases in order to obtain the most accurate data and best results in the field of prevention of blindness.

I am pleased to mention here that the Eastern Mediterranean Region supports and promotes the activities of the Saudi Ophthalmological Society in Saudi Arabia. Such activities include controlling and preventing common eye diseases and eradicating trachoma in particular as well as disseminating awareness among people with regard to eye care, sight protection, and by implanting sound health habits by holding seminars, delivering lectures, and providing other information. In 1987 and 1988, we have financed two awareness symposiums conducted in two provinces in the Kingdom of Saudi Arabia by the Saudi Society.

The Eastern Mediterranean Region in cooperation with the World Blind Union and with the Committee on Save Your Sight in Bahrain has issued 6,000 copies of a booklet entitled "Save Your Sight" in both English and Arabic. These books were distributed within the countries of the Middle East to make people aware of common eye diseases and the best ways to protect their sight. We have also produced a special video film for promoting hygienic awareness, eye care, and prevention of blindness. One thousand copies of this film were produced and distributed to the schools, health centers, universities, and institutions within the Middle East.

As IAPB Chairman for the Eastern Mediterranean Region, I have participated in symposiums held by WHO in Amman, Jordan, and Alexandria, Egypt, as well as the 37th Session of the WHO Regional Committee for the Eastern Mediterranean held in Damascus, Syria, in October 1990.

PREVENTION OF BLINDNESS IN SAUDI ARABIA

During recent years, Saudi Arabia has witnessed tangible progress in all aspects of protecting eyesight and controlling blindness. These advances have been the result of considerable development in the availability of health services and increases in the number of ophthalmologists, eye departments, and specialized eye hospitals.

Being aware of the importance of prevention of blindness activities, Saudi Arabia set out to establish eye health as one of its priority health programs and to take urgent measures in all provinces to offer proper services in the field of eye care. In addition, Saudi Arabia is doing its best to minimize the number of blind cases, as well as to reduce preventable and curable blindness to the lowest possible level, and to provide essential eye care to the most-deserving cases.

AVAILABLE STATISTICS

The number of hospitals in the Kingdom of Saudi Arabia is 156 with a bed capacity of 25,918. The total number of physicians is 12,617. The number of ophthalmologists in the Ministry of Health is 238; and the number of health centers is 1,668. As for specialized care, the Ministry of Health has two eye hospitals, one in Medina with a bed capacity of 54 and the other in Jiddah with a bed capacity of 112. There is also an advanced center for prevention of blindness and low vision in the Eastern Province. There are 49 eye sections in the central and general hospitals. The total number of beds for eye care is 895. There are also eye departments in the University and Military Hospitals. In addition, the Kingdom has established a modern specialized eye hospital in 1962, the King Khalid Eye Specialist Hospital, with a bed capacity of 263. The hospital also includes a regional training and research eye center for eye care and prevention of blindness.

SITUATION ANALYSIS

There are no exact or reliable statistics and information about the blind in the Kingdom as a whole, but estimations indicate 1.5 percent of the total population are blind. If we consider the population to be 8 million, then the number of blind people will be 120,000 persons. Cataract and trachoma are considered to be the major causes of blindness in the country. Available statistics in 1984, denote that 22 percent of the population are suffering from either active or inactive trachoma. This is in addition to other causes of blindness such as glaucoma, corneal ulcers, refractive errors, and various kinds of accidents.

During the years 1983–84, efforts were continued for the development and implementation of national programs for the prevention of blindness. One of the most important efforts in this field is the national survey on eye diseases and visual impairment, which was completed in 1984 under the auspices of the King Khalid Eye Specialist Hospital in Riyadh.

The main objectives of this field survey are: to define the magnitude of blindness and eye disease in the Kingdom, to identify the major causes of blindness and visual loss, to assess the present resources for the delivery of eye care, and to formulate a program for preventive and curative action. A nationwide stratified random-

cluster sample survey was carried out during the spring of 1984. In all, 16,810 Saudis from 15 metropolitan and 60 non-metropolitan segments were examined. This revealed a blindness rate of 1.5 percent within category 3 of visual impairment or worse. Visual impairment of from less then 6/18 to 3/60 affected 7.8 percent of the population. Visual impairment and blindness increase dramatically with age and are notably higher in females. These figures show a significant reduction from the previous estimate of 3.0 percent, which is in keeping with the improved socioeconomic and health standards in the Kingdom.

The leading causes of blindness according to this survey are: cataract (55.1 percent); trachoma (10.1 percent); corneal scars (9.1 percent); refractive errors (9.0 percent); iatrogenic disorders (4.6 percent); and glaucoma (3.0 percent). The leading causes of visual loss (blindness and visual impairment as defined above) are: refractive errors (46.0 percent); cataract (35.0 percent); trachoma (6.0 percent); and corneal scarring, iatrogenic, and congenital diseases. Trachoma has greatly decreased from previous estimates of a prevalence of 90.0 percent in the country, with an overall prevalence of 6.2 percent with active trachoma and 16.0 percent with inactive trachoma, and moderate to severe trachomatous inflammation in 1.5 percent of the population.

CATARACT

With regard to cataract, which is responsible for 55 percent of the leading causes of blindness in Saudi Arabia (1984 Survey), the Saudi Ministry of Public Health has organized a comprehensive plan to fight against cataract through health centers, particularly primary health-care centers. This plan includes carrying out general surveys in the affected areas for early detection of cataract cases, and then referral to the assigned centers for surgical operations. In addition to eye hospitals, 20 eye wards or sections were opened in 20 central hospitals to receive the referred cases and carry out cataract operations for them. Statistics of 1990 indicate that the number of cases of cataract operations in eye sections and hospitals in Saudi Arabia reached 15,000, which resulted in decreasing the number of cases of blindness by 3,000 cases per annum.

TRACHOMA

The Ministry carried out a general medical survey of blinding diseases with special focus on trachoma in the Eastern Province during December 1989 and January 1990. Experts from WHO, King Khalid Eye Specialist Hospital, and King Faisal University have participated in the survey. The Eastern Province was selected due to the high percentage of blindness that was reported there in the 1984 Survey, reaching 3.5 percent in comparison to 1.5 percent in Saudi Arabia as a whole.

A comparison of 1984 findings with those of 1990 revealed the following:

1. Decrease of blindness rate from 3.3 percent in 1984 to 1.5 percent in 1990.
2. Decrease of trachoma cases from 11.3 percent in 1984 to 1.5 percent in 1990.
3. Decrease of trachoma as a major cause of blindness from 16.5 percent in 1984 to 3.9 percent in 1990.

RETINOPATHY OF PREMATURITY

In cooperation with the Ministry of Public Health and King Saud University, the King Khalid Eye Specialist Hospital started a full-scale study of retinopathy of premature babies. The study resulted in the establishment of a clinic for treating and preventing this disease. Cases from all areas of the Kingdom will be referred to this clinic for treatment.

According to these achievements, the aspirations of the Ministry of Public Health aim at reducing the rate of the low vision and blindness in the Kingdom to a degree less than 5 percent in a five-year period.

CONCLUSIONS

There is an urgent need for formulating a national policy and a comprehensive long-term plan in every country. Mass treatment campaigns and extensive health education programs should be the main tools in rural areas. Mobile eye units instead of stationary service may be more effective at this stage. Priority should be given to primary eye care, which is a vital component of primary health care.

It also should be included in the promotion of eye health and in the prevention and treatment of conditions that may lead to visual loss.

Finally, I thank you all, wishing for your General Assembly every success.

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Regional Progress Report: Europe

Gen. Marcel Chovet

European Partners for Blindness Prevention (EPBP), an association of NGOs working in developing countries, has been formed to establish a unified presentation of blindness prevention activities to the European Community. The partners consist of Christoffel-Blindenmission, Organización Nacional de Ciegos de España, Organisation pour la Prévention de la Cécité (OPC), Oeil sur les Tropiques, Stichting Blindheidbestrijding Ontwikkelingslanden, and Sight Savers. The first coordinated program for which co-funding is being sought from the European Community is the distribution of Ivermectin to be used against river blindness in Africa.

Although the low incidence of blindness in western Europe may be an extenuating factor, ironically it appears that more is known about the epidemiology of blindness in many developing countries than some of those in the European Region. In France, OPC has taken several initiatives in stimulating epidemiological studies, including the provision of an annual award for doctors working in this field. In addition, a recent survey in the region of the Rhone has categorized the following causes of blindness and partial-sightedness: cataract, myopia, trauma, glaucoma, and diabetes.

The national blindness prevention committee in the United Kingdom, the British Council for the Prevention of Blindness, from an annual input of $160,000, has contributed to ophthalmic research within a number of centers in the United Kingdom. In addition, the Council has worked with the London-based International Centre for Eye Health to promote training of ophthalmic personnel in developing countries.

Germany's National Council for the Prevention of Blindness has been active in developing countries as well as at home. In Germany it has been concerned with studies into the incidence of glaucoma and diabetic retinography and, notably, has achieved a strong working relationship between the Munich University Ophthalmic Department and the ophthalmic program operating in Kenya.

There is a great need for support from Western Europe for the development of community ophthalmic services in East and Central European countries. There is a dearth of equipment available to specialists in these underdeveloped countries, and a great need for dialogue under the aegis of the IAPB between developed and developing European countries.

I wish to conclude this report with recommendations for expansion of the membership of EPBP, the furtherance of epidemiological studies throughout Europe, and increased collaboration among all European ophthalmic departments and nongovernmental organizations.

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Regional Progress Report: South-East Asia

Dr. R. Pararajasegaram

INTRODUCTION

The Region of South-East Asia is the second largest WHO Region and comprises 11 countries ranging from India, the second most populous country in the world to the Republic of Maldives with a population of just over 200,000. The 11 countries belong to the category of developing countries, and five are classified as least developed countries. The total population of the region amounts to over 1.3 billion with an under-5 population of 15 percent and an over-55 population of 128 million. The average growth rate of population in the region is approximately 2.2. There is, however, an age differential in this growth of population. It is projected that the over 55 population will increase significantly in the next 30 years. This demographic trends will have grave implications on our efforts to combat blindness, given the fact that age-related conditions such as cataract, glaucoma, and even posterior segment diseases like diabetic retinopathy and retinal and senile macular degenerations are already causes of concern.

MAGNITUDE OF BLINDNESS AND VISUAL IMPAIRMENT

Most countries have fairly reliable data on the prevalence of blindness and the incidence of blinding disorders. Some (Nepal, India, Thailand, and Indonesia) are based on national surveys. Others (Sri Lanka, Bangladesh, Maldives, and Bhutan) use more localized or hospital-based data. It must be remembered that national averages could be misleading because there is wide variation within countries. Prevalence rates ranging from 0.2 percent in Mongolia to 3.0 percent in some parts of Myanmar (Burma) have been reported.

Over 50 percent of all blindness is due to cataract and it is

estimated that there are 10–14 million persons blind (vision of less than 3/60 in the better eye with best correction) from cataract alone. The South-East Asia Region also has the largest incidence of childhood blindness, with xerophthalmia being the major etiological factor. It is estimated that one child goes blind every minute in the world. This rate occurs primarily in Bangladesh, and in some parts of Indonesia, Nepal, and India. Blinding trachoma is of concern perhaps only in parts of Myanmar and in small pockets in Nepal and India. The problem of visual impairment from refractive errors is of increasing concern in most countries because of the impact it has on the educational process in children and young adults, and the unavailability or high cost of the available glasses. Other causes of blindness such as angle closure glaucoma in Myanmar and climatic droplet keratopathy in Mongolia are generally more localized problems. Ocular trauma and corneal infections are leading causes of monocular visual loss in nearly all countries.

PROGRESS IN PERIOD OF REVIEW (1987–90)

The period of review has been a period of turmoil on many fronts in a large number of the countries in the region. Global events have had severe repercussions on economic growth. This lack of growth has had a negative effect on the development of health and social programs, which often bear the greatest brunt of these fallouts.

Despite this rather depressing scenario, it gives me pleasure to record the strides that have been made in activities for the prevention of blindness and the restoration of vision in nearly all countries of the region. It is fortunate that representatives from eight of these countries are present at this Assembly and have the opportunity to share their experiences and achievements with us during this week. Drs. S.R.K. Malik and Rajendra Vyas, who have worked with me on the Indian National Program, will deal specifically with that Program and the role of the non-governmental organizations. I might add that Dr. Vyas has shown commendable leadership qualities and dedication for more than two decades during his close association with the Royal Commonwealth Society for the Blind.

I will confine my statement to a general overview of the eye-care activities in the region as a whole. At the outset I would point out that these achievements have come from a close collaboration between national government programs, intergovernmental organizations (such as WHO, UNDP and UNICEF), and a number of

international and national NGOs, including bilateral and other funding agencies. Working with the common objective of preventing and controlling blindness and providing eye care, these sectors have often merged their resources and shared their experiences and expertise. Except for specific projects, it is not possible to single out individual inputs and I will not endeavor to do so.

To strike a personal note, my task as Regional Chairman has been greatly facilitated by my association with the WHO Program for the Prevention of Blindness, first as a staff member and later as a periodic short-term consultant. With the IAPB and the WHO's programs having a very close congruence, if not identical aims, an independent IAPB structure has not been considered entirely necessary nor has it been developed in the South-East Asia Region.

Two major developments need to be highlighted in this report. The first concerns the inception of National Committees and the formulation of National Programs. Ten out of 11 countries have a formal national level established, ranging from a focal point in the Ministry of Health as in the Maldives and Mongolia to national and state committees as in India. These committees are generally multidisciplinary and have government patronage. They include NGOs in the field of blindness prevention. Some national committees have gone further and developed special task forces or advisory committees for specialized facets of the program such as eye health education and outreach services. In some countries national programs that had been formulated some years ago have been reviewed and refined.

The programs in Nepal and India have had such reviews and we expect to hear of the outcome of these quick evaluations from the national delegates. In other cases there have been reorientations both in the concept and content of the national program. Indonesia and Sri Lanka are good examples. Some programs have targeted special local problems such as acute angle-closure glaucoma in Myanmar and corneal degenerations and glaucoma in Mongolia. However, the basic strategy in all of these programs is the delivery of eye care as an integral part of primary health care, and nowhere is this more explicitly demonstrated than in Thailand and to a lesser extent in Bhutan. Whereas manpower training has been a priority activity in nearly all national programs, some innovative approaches adopted in countries like Bangladesh, Sir Lanka, Nepal, and Thailand deserve special mention.

The other major development that has been launched somewhat

belatedly is regionally based training in managerial skill development for ophthalmologists and program managers. Several program reviews in the area of health care delivery had indicated that although resources were available, program implementation and output fell far short of expectations. This was also true of the national prevention of blindness programs. The major weakness identified as the cause of this shortfall was the paucity of managerial skills at all levels of the program.

To meet the requirement for management development, a training course was instituted at the Institute of Public Health Ophthalmology in Korat, Thailand, early this year. This course became reality through the efforts of Dr. Konyama and the unparalleled support given by our Senior Vice President Dr. Akira Nakajima and his Center in Juntendo. For the first time it brought together participants from two WHO regions in an international faculty. Various aspects of community-based training were imparted. Skills in epidemiology, planning, health economics, teamwork, leadership and other aspects of management were included. This course is likely to be the forerunner of similar courses in the future.

A related development, which was planned for some time, is the establishment of an Institute of Community Ophthalmology affiliated with the world-renowned Aravind Eye Hospital in Madurai, Tamil Nadu, India. At a recent planning meeting under the auspices of the Aravind Eye Hospital and Seva Foundation, plans were finalized for completing this Institute in 1991. With the opening of such a facility in the region, the need to train ophthalmologists from developing countries in settings approaching their own environment will be addressed. This venture should receive generous support from all agencies and organizations interested in developing and supporting programs for the prevention and control of blindness in the countries of Africa, Asia, and elsewhere.

Among the other noteworthy achievements in the region, the whole area of manpower and human resource development deserves mention. It is perhaps adequate to state at this time that human resource development for eye-care delivery has taken various forms and processes. Apart from formal, customized courses of study in community-oriented eye care and the training of various cadres of personnel in subspecialties, there have been site visits in the form of study/observation tours to the excellent centers in the region, particularly those proficient in community-based services. Examples of the salutary effects of such a form of exposure of senior ophthal-

mologists and program managers are forthcoming from Sri Lanka, Indonesia, and Myanmar.

Two other aspects of eye care that have relevance to sustainable eye care were initiated in the region under the auspices of a project supported by the United Nations Development Program (UNDP). The establishment of a local production means for eye medication was put into action as a part of national programs. This became necessary in the context of the spiralling cost of eye medication in most countries of the region. This followed an initiative taken by the WHO Prevention of Blindness Program with the cooperation of Christoffel-Blindenmission (CBM), which has had several years' experience in this field, particularly here in Africa.

The second innovative endeavor involved the inception of low-cost eyeglass production units to provide indigent populations with affordable spectacle correction. Such innovations have great potential to meet the needs not only of children and young adults with refractive errors, but also to make strides in the correction of presbyopia for an ever-increasing population of presbyopes. Furthermore, the needs of the large number of persons who have been operated on for cataract but who cannot afford the added costs that accrue from the implantation of intraocular lenses can be addressed as well.

Primary eye care has come of age in the South-East Asia Region. Almost all national programs have shown that eye care could and should be delivered as an integral part of primary health care with community-based action and excellent tertiary centers playing a supportive role in training, research, and specialized service delivery. Primary health care has received a significant boost through the introduction of cataract surgery at the primary health-care level. For this booster effect to be sustainable, however, we must not rely solely on numbers. The whole question of quality assurance and evaluation of results needs to be addressed. Quality care in preoperative assessment, surgical technique, and postoperative follow-up is mandatory. While we speak of Cataract-Free Zones we must also ensure that they will be blindness-free zones as well. It would be a great human tragedy and a travesty if we leave behind a trail of elderly persons who have traded their painless curable blindness for painful permanently blind eyes.

Ladies and gentlemen, in conclusion it is fair to say with humility, but with satisfaction, that the countries of the region have led the way in tackling the immense burden of needless blindness with

dedication, innovation, and hard work. Many of those involved in this crusade and the non-governmental organizations that supported them are here at this Assembly, and I salute them. However, much more remains to be done in the wake of increasing target populations and in the context of new advances that research and development is making possible. While we strive for excellence in stripping preretinal membranes or designing high-technology lasers to sculpt the cornea, let us remember that it takes only some dark-green leafy vegetables or a little vitamin A in the short term to make the difference between light and darkness for hundreds of thousands of children. We have a social obligation to do both if sustainable eye health for all by the year 2000 is to become a reality. Thank you.

10

Regional Progress Report: India[1]

Prof. S.R.K. Malik

PREVENTION AND CONTROL OF BLINDNESS IN INDIA: 1986–90

INTRODUCTION

Blindness is one of the major health problems in the developing countries in Asia, Africa, and Latin America. About 90 percent of the world's blind population is located in these countries. Compared to prevalence of blindness rates varying between 0.15 percent and 0.25 percent in the industrialized countries of Europe and North America, the rate is over 1.0 percent in many developing countries.

Two thirds of the world's blindness is accounted for by cataract, trachoma, xerophthalmia, and onchocerciasis (or river blindness). In Asia, over 70 percent of blindness is due to cataract; and glaucoma, trachoma, and xerophthalmia are other significant causes.

BLINDNESS IN INDIA

India has perhaps the largest blind and potentially blind population in the world. Various estimates of the magnitude of visual impairment and blindness have been made, as a result of surveys at different times. The two landmark surveys of 1971–73 and 1986–88 show that the prevalence of blindness (visual acuity of less than

[1]The unabridged version of this paper, including tables and workshop recommendations, is available from Dr. Carl Kupfer; National Eye Institute; National Institutes of Health; Bldg. 31, Rm. 6A-03; Bethesda, Maryland 20892, USA.

6/60) has increased during this period from 1.40 to 1.49 percent of the population. Blindness is more prevalent in rural areas (1.62 percent), which constitute over three fourths of the population, than it is in urban areas (1.03 percent).

The changing pattern of the causes of blindness and their relative magnitude in India illustrates that cataract has emerged as a more predominant cause of blindness, accounting for about 81 percent of total blindness in India, as compared with 55 percent two decades ago. The prevalence of glaucoma has since become four times as great. Refractive error and central corneal opacity have also become prominent, calling for urgent corrective action. On the other hand, trachoma and vitamin A deficiency now appear less of a problem.

THE NATIONAL PROGRAM FOR CONTROL OF BLINDNESS

Recognizing that 85 percent of blindness is either preventable or curable through treatment by modern medical or surgical interventions, a scientifically and comprehensively conceived National Program for Prevention of Visual Impairment and Control of Blindness, which later was renamed the National Program for Control of Blindness (NPCB), was launched by the Government of India in 1976. It aimed at reducing the prevalence of blindness from 1.4 percent to 0.3 percent by the end of the century. The fourfold approach of this program was to intensify educational efforts on eye-health care; provide immediate relief to people with cataract and other eye diseases in far-flung areas through mobile units and eye-camps; establish permanent properly equipped eye-care infrastructures at various levels, which would include the development of ophthalmic and ancillary manpower and fully involve voluntary and non-governmental organizations as well as the private sector in eye care.

EYE-CARE SERVICES

Considerable progress has been made in developing the infrastructure of eye-care services. Of the 42,000 eye beds, 4,000 are in mobile units, 3,800 in district hospitals, 11,500 in eye hospitals, 6,200 in medical colleges, 2,000 in regional eye institutes and at the Dr. Rajendra Prasad Centre for Ophthalmic Sciences in New Delhi, and 14,500 in private nursing homes and with private practitioners.

Besides, beds in public health care facilities in a number of states are used for eye patients, whenever eye camps are organized there.

MANPOWER AND TRAINING

For ophthalmic manpower development, degree and diploma courses for postgraduate work in ophthalmology are available in 100 medical colleges, regional and national eye institutes, and in some postgraduate institutes in the voluntary sector. In all, they train between 275 and 300 postgraduates per year. For training of ophthalmic assistants, 37 training centers have been established.

CATARACT SURGERY

About 60–65 percent of cataract operations in India are performed by voluntary societies and non-governmental organization all over the country, largely through the eye camp approach. Whereas the total performance of over 9.5 million during 1981–90 appears creditable, the annual performance has touched a plateau of less than 1.2 million, in spite of augmentation of the infrastructure. Among the reasons diagnosed for this levelling off are:

1. Underutilization of existing facilities either because of inadequacy of trained personnel or funds.
2. Underutilization of available ophthalmic manpower for community cataract surgery.
3. Increasing switch-over to cataract surgery with IOL.
4. Socioeconomic barriers among people in rural areas, including nonavailability of family members to accompany them; extreme poverty causing inability to travel to eye camps; and the belief, particularly in the north of India, that eye operations should be avoided during the summer months and the rainy season.

CURRENT MAGNITUDE OF THE CATARACT BACKLOG

The recent NPCB-WHO survey has revealed that about 81 percent of the blindness in India is due to cataract. Supplemented by another recent cataract prevalence study, the tentative conclusion is that,

based on a population of 800 million, there are currently 22.26 million operable cataract eyes (visual acuity of less than 6/60) of which 8.42 million are mature or hypermature cataracts that need to be operated urgently. There are 52 million immature cataracts and another 18 million incipient cataracts. The problem is likely to become more acute in the coming years because of the change in the demographic pattern: there will be a greater percentage of persons in the over-40 age group—those who naturally have a higher cataract potential. Dealing with these problems will require a massive increase in cataract surgeries to roughly 4 million or more operations per year, as compared with the present annual level of 1.2 million.

PROPOSED REMEDY FOR TACKLING THE BACKLOG

The remedy lies partly in: 1) making optimal use of the existing ophthalmic manpower and hospital facilities through incentives and use of management strategies; 2) encouraging new and innovative approaches; and 3) establishing a large number of base eye hospitals all over the country, particularly at the subdivisional level.

At present, out of 6,500 ophthalmologists in India, only one third are actively involved in providing community cataract surgery. Many more need to be oriented and trained for this purpose and immersed in it by various approaches, including incentives.

NEW APPROACHES FOR ACHIEVING HIGHER CATARACT OPERATIONS:

Optimizing Utilization of Eye Hospital Infrastructure During Lean Months

In Northern India, without any sound scientific basis, summers and rainy seasons have traditionally been lean months for cataract surgery. Consequently, hospital facilities have remained greatly underutilized during these months. To correct this, an experimental operational research project has been taken up jointly by the National Society for the Prevention of Blindness (NSPB)—India, Sight Savers (Royal Commonwealth Society for the Blind), and Multanimal Modi Charitable Trust (at Modinagar Eye Hospital since April 1990).

With this hospital as the base, eye-health educational activities

for molding public opinion and dispelling doubts and fears about eye surgery during the months of April through October 1990 were taken up in the hinterland near this hospital with the help of local voluntary organizations. Screening camps were held at specified places in the catchment area. Identified cataract cases were brought to the base hospital at Modinagar for free surgery and transportation back home. The hospital wards were air-cooled to make the patients more comfortable.

As a result, the output during April–September 1990 was 1214 cataract surgeries as compared to an average of 355 surgeries during the same months in the three preceding years (1987–89). In fact, not only were the existing facilities fully utilized but more beds had to be added to meet the additional demand. During one of these six months, full motivational work could not be done due to unsettled political conditions. Otherwise, the performance would have been even better. The awareness created through the motivational campaign has led many more patients to come directly to the hospital and the tempo has been sustained even after the lean period. During October 1990, the number of surgeries was 291 as compared to an average of 143 surgeries during October 1987–89.

BASE HOSPITAL APPROACH

The approach of having the base eye hospital function at an optimal level of available facilities, including eye beds, through the process of creating demand, organizing screening camps in the catchment area, and transporting the diagnosed cataract cases to the base hospital is less costly and organizationally less hazardous than organizing eye-care camps. This approach is in keeping with the basic objectives of NPCB and is being successfully tried out by a number of voluntary organizations working in the field of eye care.

CATARACT-FREE ZONE

Another innovative approach has been experimentally tried with considerable success by NSPB in Datia District (population 372,000) of Madhya Pradesh in collaboration with the District Collectors and the Chief Medical Officer (CMO) to make it a cataract-free zone for the time being. This consisted of screening the entire population in the age-group of 40 years and above (about 67,000

persons). This was done with the help of district paramedical and revenue staff, who helped locate blind persons (with visual acuity of less than 6/60) and, aided by ophthalmic teams, identified those suffering from cataract. Eye camps were organized in which 84 percent of all identified cataract cases were operated upon.

This experiment, which took only six months, was made possible by the personal involvement and dedicated leadership provided by the collectors, Mr. Pravesh Sharma and his successor Mrs. Amita Sharma. This experiment has shown that motivated district collectors can provide the requisite leadership in collaboration with dedicated voluntary organizations working in the field of eye-health care to make a given area cataract-free within a specified span of time. In this way, the cataract backlog has been reduced to a manageable limit that can be taken care of by the existing infrastructure. Encouraged by this experiment, NSPB has requested the Government of India to select districts in the country where collectors will be given responsibility to make them cataract-free. Some districts, particularly in Tamil Nadu and Himachal Pradesh, have already started work in this direction.

EYE BANKING

Although at present there is an estimated backlog of 365,000 corneal grafting cases in India, only about 3,000 operations are performed annually. The annual availability of donor tissues is at present about 7,000 eyes as compared to 3,000 some four or five years ago.

This increased availability is due to the vigorous efforts made to create awareness of eye donations, particularly by the Times Eye Research Foundation (TERF) as a result of which 215,000 pledges for eye donations have been received. The total number of pledges at present is 325,000 lakhs. Increases in the number of eye banks from 45 in 1983 to 146 in 1990 has also improved availability. Although not all of them are of the requisite standards of surgical care or efficiency, some render good service. The eye bank run by the Indian Red Cross Society, Dholka Branch in the Ahmedabad District of Gujarat under the stewardship of Mr. Gautam C. Mazmudar with the help of its 53 rural eye collection centers provides over one fourth of the total eyes collected in India. This Society with the help of NSPB is experimenting with new approaches for

getting cadaver eyes. However, most other eye banks need to be helped to become equally efficient. Many districts in the country are without any eye bank or eye collection centers. The Government of India is planning to expand eye-banking facilities and set up at least one eye collection center in each district, establish eye banks in all of the remaining medical colleges where they do not exist at present, and also involve organizations in the voluntary sector.

VITAMIN A PROPHYLAXIS

The program of vitamin A prophylaxis for children has been carried on all over India since 1971, as a part of the Maternal and Child Health (MCH) Program of the Department of Family Welfare. Its coverage through the MCH network presently extends to about 60 percent of the eligible children. The recent survey shows that prevalence of nutritional blindness due to Vitamin A deficiency has come down to 0.04 percent as compared with 2.00 percent two decades ago. But doubts have been raised in many quarters about the degree of reduction projected by the recent survey—a situation that would warrant further detailed surveys.

REFRACTIVE ERRORS

Visual impairment due to refractive errors in children has assumed special prominence. This problem is being combated by intensifying eye screening of children by NPCB's mobile units and various voluntary organizations, particularly NSPB functioning centrally and through its state and district branches. An innovation introduced involves rural school teachers in the screening program. The West Bengal branch of NSPB has so far involved 2,114 rural teachers in 1,313 schools covering 1,717 villages in the rural areas of the State, reaching about 283,000 children. About 13–14 percent of the children are found to suffer from ocular ailments and are referred to the nearest eye clinic for further ophthalmic advice and treatment. In the Jalgaon District of Maharashtra, eye screening of all schoolchildren has been completed by involving schoolteachers with the help of the Zila Parishad District administration. These innovations are proposed to be replicated in other parts of the country.

EYE-HEALTH EDUCATION

Under NPCB, intensification of educational efforts on eye-health care is a priority step in the action plan. This calls for involving all available mass media, both electronic and others, and optimizing the use of the existing extension education network—and even extending it.

A lot of work is being done in this field both at the central and state government levels as well as by NSPB in the voluntary sector. Eye-health education materials in the form of posters, charts, folders, and booklets have been produced by the central and some state health education bureaus and by NSPB and have been widely distributed and exhibited. NSPB brought out a report on the "Safe Approach to Eye Camp Surgery" as a result of the national seminar which it organized after some mishaps at eye camps came to its notice. The guidelines that were developed have been widely distributed.

During the last four years, NSPB has taken up intensive eye health education program. Some of the salient components are as follows:

1. **Public Lecture Series**
   In collaboration with UNICEF, a series of popular public lectures were organized covering topics such as nutritional blindness, eye injuries, glaucoma, squint, contact lenses, diabetes and the eye, and cataract surgery and IOL implants. The second series of public lectures on pediatric ophthalmology is being organized, again in collaboration with UNICEF.

2. **Poster and Essay Competitions**
   Such competitions on various themes of eye care, prevention of blindness, and public interest and participation in improving the health of the nation have been annually organized for schoolchildren and others. The winning poster entries have been included in the Society's poster series for wide distribution.

3. **Prevention of Blindness Week**
   Every year NSPB and its branches observe Prevention of Blindness Week in early April in which a subject of public health importance relating to eye care is chosen as the theme. National focus is given to the theme by extensive coverage

through television and radio networks, newspapers, public lectures, display of banners, hoardings, and wide distribution of publicity material on the topic. State health departments also participate in observance of this week. During the last four years, the topics covered have included glaucoma, industrial blindness, prevention of eye injuries, and prevention of blindness in children.

4. **National Fortnight on Eye Donations**
   This fortnight is observed by NSPB and its various branches along with the Times Eye Research Foundation (TERF) to create awareness of the problem of corneal opacity and the importance of eye donations.

5. **Press Releases and Features**
   Press releases and features are periodically issued on various eye-related topics, e.g. hazards to eye health by crackers, colored water balloons, bows and arrows, and colored powder, particularly during the holidays of Holi, Diwali, and Dussehra.

6. **Special Campaign on Glaucoma**
   In collaboration with NPCB, a special educational campaign on glaucoma was mounted relating to the increased prevalence of this blinding disease and the need for timely check-ups. Two colored posters and two folders entitled "Glaucoma—A Lurking Thief" and "Glaucoma—A Blinding Disease" were produced and widely distributed through State Health Departments.

7. **Special Advertisement Campaign**
   A special campaign for public education on various eye-health topics was organized by advertisements through national and regional newspapers and periodicals all over India. The messages were in layman's language on topics such as "Your child's eyes—Mothers, do you know?"; "Is your child squinting?"; "Do not ignore conjunctivitis"; "Glaucoma—a blinding disease"; and "Diabetics, beware!". More topics are being addressed in a similar advertisement campaign that will constitute the second stage.

8. **Quarterly Journal "Hamari Aankhen"**
   The Society publishes a quarterly journal called "Hamari

Aankhen," which contains useful information and articles on eye-health care for wide distribution.

9. **Some Innovative Projects**
Some of the branches of the Society have launched innovative projects such as providing eye screening for vehicle drivers and operators of heavy-duty equipment, developing a home eye-testing chart, and involving rural schoolteachers in eye screening of children.

10. **Resource Center Set Up**
A resource center for eye-health educational material has been set up by the Society whereby all printed, audio, and video materials on eye-health care are being collected from different organizations from both within the country and abroad. A large treasury of such materials has already been received and is being stored for necessary documentation for use as reference and resource materials and for production of educational material on eye health care.

11. **Workshop for Media Persons**
To remedy the existing gap of inadequate in-depth exposure of media persons to various aspects of blindness, including its magnitude; causes; prevention, cure, and rehabilitation; social and economic aspects; as well as what is being done to solve the problems in this field and what more is needed, NSPB organized a workshop in collaboration with WHO and the Ministry of Health. Media personnel were drawn from both print and electronic media. This three-day workshop, which was the first of its kind to be organized by an NGO in India, was attended by 25 senior media persons and 29 health administrators, health educators, social scientists, and ophthalmologists. It created better understanding and appreciation of the problems connected with blindness and resulted in more coverage of both news and features related to blindness.

As a result of recommendations by the Central Coordination Committee of NPCB, two or three lectures from this program have been included in the course for Indian Administrative Service probationers at the National Academy of Administration in Mussouri

with a view to making these administrators aware of possible blindness problems in their districts.

The States have been asked to establish District Blindness Control Societies which will function under the District Collectors for implementation of NPCB by involving the voluntary organizations of the area. These societies will also be able to raise funds from local sources for monitoring the program.

REVIEW OF PROGRAM IMPLEMENTATION

The implementation of this program was reviewed by two national workshops organized by the Ministry of Health and Family Welfare and NSPB respectively during the first quarter of 1989. NSPB's three-day workshop, which was attended by over 70 participants, including senior ophthalmologists, health administrators, social scientists, and representatives of voluntary and non-governmental organizations and international agencies, made an in-depth appraisal of the impact of various program components on control of blindness and made important recommendations for more effective implementation and progress. These recommendations received considerable attention at the highest government quarters and also of the Planning Commission. Important recommendations of the two workshops are available (see footnote on page 85).

INTERNATIONAL INTEREST AND PARTICIPATION

The program has evoked keen interest, involvement, and support of international organizations and agencies. WHO, DANIDA, Sight Savers, Christoffel-Blindenmission, Helen Keller International, Seva Foundation, Operation Eyesight Universal, and other international agencies have provided generous help for specific activities under the program or to voluntary organizations working in the field of prevention of blindness. DANIDA's assistance in Phase I has considerably helped the program in establishing the infrastructure, mobile units, and training.

In phase II it will assist in the field of equipment and transport, pilot district projects, training activities, and monitoring systems. About 25 percent of the cataract surgeries done by voluntary organizations have been financed largely by Sight Savers and Christoffel-Blindenmission. The former has been particularly

helpful in funding the construction of small rural eye hospitals, child-development service projects, and in providing eye-care facilities to victims of the Bhopal gas tragedy.

CONCLUSION

During the last four years, the Government of India's commitment to and the community involvement in this national program have continued unabated. In fact, this program has witnessed great cooperation and coordination between government on the one hand and voluntary, non-governmental, and international agencies on the other. The recent NPCB-WHO survey has, however, shown that the country has a long way to go, particularly in treating the cataract backlog, to reach the avowed goal of reducing blindness prevalence to three per thousand in the general population.

The successful and innovative approaches mentioned earlier must be made a regular part of the program. More financial and other resources must be made available for extensive eye-health education activities. Eye-banking projects must have fuller involvement of the voluntary NGOs. In tackling the cataract backlog there should be increased stress on total eye care with greater attention to glaucoma, refractive error, and corneal blindness. There should be regular monitoring and evaluation of the program and greater use of management approaches. The program should not be allowed to wither because of a lack of adequate resources. Finally, greater community participation and financial support—both national and international—must be forthcoming for this noble cause.

11

Regional Progress Report: India, Bangladesh, Pakistan, and Sri Lanka

Dr. Rajendra Vyas

At the beginning of this century, some 90 years ago, blindness in the 11 countries of the South-East Asia Region was rampant. Over the last nine decades and especially since the Second World War, because of the progress in ophthalmology and development of better techniques, cataract—the giant among the causes of blindness in this part of the world—has been the focus of attention. After cataract the major causes of blindness in this part of the world are refractive errors, glaucoma, and central corneal scars.

In Bangladesh, India, and Sri Lanka, efforts made by governmental agencies and NGOs at both national and international levels have helped make the public aware that cataract blindness can be cured. What is alarming is that cataract blindness on the Indian sub-continent is expanding, possibly because of the increasing life span. It is said that in India alone the prevalence rate of blindness in both eyes has increased from 1.40 percent to 1.51 percent, according to a NPCB-WHO survey. Applying this criteria to the population projection of 1989, the number of cataract-blind in both eyes in India will be 13.21 million. According to a survey by Drs. Darwin Minassian and Vijay Mehra, the number of persons becoming cataract-blind in both eyes is 3.80 million per year.

INDIA

Among the 11 countries in the region, perhaps the greatest strides in eliminating cataract blindness have been taken in India with the help of national programs for control of blindness and funding from international non-governmental organizations. This effort began with just 50 eye camps in 1970 and today, after 20 years, the number of eye camps conducted annually is as high as 2,500. Over the last

20 years, the sight of 2 million people has been restored and over 20 million have been treated for various eye ailments. Following in the footsteps of Sight Savers, which initiated its action against blindness in 1970, the Government of India formulated its National Program for control of blindness and visual impairment in 1975. Training courses for ophthalmologists, paramedics, and ophthalmic assistants, plus the use of mobile ophthalmic vans and the upgrading of all district hospitals have formed an essential ingredient of the national program for control of blindness and visual impairment.

BANGLEDESH AND PAKISTAN

Eighteen years ago, when Bangladesh became independent, it had two ophthalmic hospitals in the voluntary sector and a few ophthalmic beds attached to medical colleges in Dhaka and Chittagong. I was privileged to initiate prevention of blindness activities in Bangladesh on behalf of Sight Savers 17 years ago and today Bangladesh has several eye hospitals and a large number of trained ophthalmologists and mobile ophthalmic vans. In the beginning stages, these ophthalmologists were trained in India and Singapore, and later training was begun in Bangladesh. Pakistan too had been suffering from lack of trained personnel and adequate ophthalmic facilities. With the intervention of Sight Savers and the state, considerable interest has been stimulated; and in Sind, Baluchistan, and Punjab, a limited number of well-equipped ophthalmic centers have been established to help the poor.

SRI LANKA

Sri Lanka began its national prevention of blindness program in 1970–71 with the establishment of a mobile ophthalmic unit. The assistance of Sight Savers was particularly important at the outset. However, local organizations subsequently began to show keen interest and a low-vision aid center was established. Unfortunately, because of recent unstable conditions, the progress in Sri Lanka has been thwarted. We hope that conditions will soon improve, so that work can be expanded.

CONCLUSION

Four years ago when the last IAPB General Assembly was convened

in India, the picture was darker. There was a paucity of trained personnel, inadequacy of financial resources and unwillingness of ophthalmologists to operate in rural areas. To some extent, these factors have decreased. However, it would be hoping against hope to say that all cases of preventable or curable blindness will come under the purview of community ophthalmology by the end of this century. A Herculean effort will have to be made especially by the NGOs at national and international levels to create awareness, both within the masses and within those in power, to prevent or cure avoidable blindness.

12

Regional Progress Report: Western Pacific

Dr. Frank Billson, Dr. Kazuichi Konyama, and Dr. Lim Kuang Hui

WESTERN PACIFIC REGION

The problem of blindness in the Western Pacific Region is similar to the rest of Asia, although it is generally of less severity in the majority of these countries. Much of the blindness in the region is preventable and curable by application of known technology.

The great diversity in socioeconomic development within the countries of this region reflects their problems relating to blindness. The situation is further compounded by geography and climate as well as socioeconomic and cultural background.

The emphasis of WHO collaboration has been on the development of national prevention of blindness programs that focus on essential eye care especially in underserved areas. In the developing countries in the region the overall blindness rate varies between 0.2 percent in Korea and 1.0 percent in countries like Laos, Vietnam, and the Philippines. The main causes of blindness in this region are cataract, injuries, malnutrition, trachoma, and infections. Available data illustrate that countries in the region fall into three distinct groups:

1. Those that have active national programs or are able to act as the resource such as Australia, Japan, New Zealand, and Singapore;
2. Those that have initiated national programs like China, Vietnam, and Laos; and
3. Those that have programs being implemented within their countries like Malaysia, the Philippines, and the South Pacific Islands (Oceania).

SOUTHERN SUBREGION

The southern part of the Western Pacific (Oceania and New Zealand) prevention of blindness activities pose special problems with 30 countries and territories occupying 20 to 30 thousand islands inhabited by a total of 10 million people. Many islands have fewer than 100 people, and many islands have none at all. Since the 1960s, island groups have demanded and been given the freedom to govern themselves. Fiji and Papua New Guinea are the largest developing nations in this region; and Australia and New Zealand are industrialized countries with the resources and the will to assist.

Fiji and Papua New Guinea have medical schools, and we can anticipate the training of ophthalmologists and eye-health workers in both the University of the South Pacific (in Fiji) and in the University of Papua New Guinea. Over 70 percent of the doctors in the South Pacific were trained in the Fiji Schools of Medicine. Consequently, there is a tradition of training in the region. Both Fiji and Papua New Guinea are developing national primary eye-care programs.

Regional blindness rates range between 0.2 percent in Australia and 1.0 percent in countries like Papua New Guinea, however much of the cataract blindness is being addressed by teams of Australian Eye Doctors organized through ASPECT (Australian South Pacific Eye-Care Team) with funding from the Australian Government's aid program, the Australian International Development Assistance Bureau. Some countries such as the Solomons have sought to have the service of a full-time ophthalmologist with assistance from non-governmental organizations such as Sight Savers and Foresight. In addition, Australia has assisted in the training of an ophthalmologist from Tonga.

Partnerships of international NGOs, including Sight Savers, Helen Keller International, and Christoffel-Blindenmission have collaborated with South Pacific Islands in developing prevention of blindness programs in association with the South Pacific Council for Blind Persons and Blindness Prevention.

PAPUA NEW GUINEA

The Australian government, which has continued to have strong links with Papua New Guinea, is committed to respond to requests for development in Papua New Guinea in the area of blindness and

its prevention. International non-governmental organizations such as Sight Savers (Royal Commonwealth Society for the Blind), Foresight, Helen Keller International, and Christoffel-Blindenmission have assisted. Recently the Papua New Guinea government appointed a national director of its prevention of blindness program. The implementation of the program, which is centered on primary eye care, is about to commence. The primary eye-care program will also include a health extension officer and a nursing orderly. However, such a comprehensive program faces difficulties in a country with 3 million people and 800 languages and where mountainous terrain makes transportation links impossible and air links imperative. In Papua New Guinea there is a shortage of eye doctors, as there is in the Pacific public sector in general, with rewards being higher in the private sectors. Nevertheless, the work force for eye care is increasing.

Because the proximity of Australia to Papua New Guinea makes close cooperation in prevention of blindness activities logical, there is already collaboration in training eye doctors.

SOLOMON ISLANDS

An ophthalmologist financed by Sight Savers is working full-time in the South Pacific and has played an important role in assisting primary eye-care services. In addition, he has worked with a Solomon Islands ophthalmologist who had also received training in Australia.

TONGA

A WHO scholarship and assistance from Foresight have helped train a Tongan ophthalmologist in Australia. This ophthalmologist has already carried out a survey of blindness and has formulated a national prevention of blindness program.

Vanuatu, Kiribati, Tonga, Tuvalu, the Cook Islands, and the Solomons are island nations that are good examples of the problems of development of eye-care services and prevention of blindness activities in the South Pacific. Because of the relatively low population, the number of necessary cataract surgeries can be encompassed by the visiting team of foreign surgeons. However, because these countries desire and need to develop their own

in-country eye-care services, it is necessary to initiate in-country surgical services and in-country eye-care education where possible.

Since 1984 the Australian South Pacific eye-care team has visited the above nations and has provided surgical services. In addition, a training component has been introduced. The program in the Solomons was discontinued in 1985. However, Tonga in 1986 and the Cook Islands in 1989 have received surgical services with a training component.

Annual visits are made to the following countries: Vanuatu, Kiribati (two teams visit; the first provides outpatient and teaching services, the second performs surgery and undertakes the surgical training of a Kiribati doctor), Tonga, Tuvalu (biennially because of the small population), and the Cook Islands (also visited biennially).

The training of personnel to perform eye surgery continues to progress satisfactorily in Vanuatu and Kiribati, the two most populous countries visited by the eye-care team. The small volume of surgery in Tuvalu would make it difficult for a surgeon to maintain his skill.

In 1989 this team carried out a population-based survey of eye disease in the Pacific, providing data on the prevalence of blindness in Melanesia. Another survey has been conducted in Tonga and has provided data for Polynesia. The repetition of these surveys at regular intervals will provide a method of determining the effectiveness of surgical interventions and of the eye surgeons who are being trained in-country.

AUSTRALIA

Foresight is an Australian international aid and prevention of blindness agency seeking to complement existing eye-care services. In the South Pacific it is committed to work with other NGOs in the region, including Sight Savers, Christoffel-Blindenmission, and Helen Keller International.

NEW ZEALAND

New Zealand, as part of Oceania, also has been a resource in the area and has assisted training and development in the Cook Islands

and Fiji. The possibilities of collaboration with Australia should be gradually developed.

CHINA

The blindness survey carried out in the period 1984 to 1986 in many parts of China, revealed that the overall blindness rate ranges from 0.14 percent in Guangdong to 0.67 percent in Fijiang; the average is about 0.50 percent. Trachoma, believed for a long time to be the major cause of blindness in China, has declined and now cataract has become the center of concern. This blindness survey took place mostly in rather well-serviced areas. Although the overall situation within the underserved areas is unknown, the blindness rate may well be higher and include trachoma.

The vastness of China makes it difficult to estimate the total number of unoperated cataract cases. In addition, the survey did not study underserved or remote areas. Therefore, the number of unoperated cataracts could be as high as 3 million.

The Beijing Institute of Ophthalmology, Dong Ren Hospital, in Beijing, which accommodates the National Board of Blindness Prevention, has recently been nominated as a WHO Collaborating Center. The Chinese national programs were formulated in 1986 and more than 20 provinces identified their own pilot counties to launch primary eye-care development projects. One of the goals of these programs is to develop mass-intervention projects for cataracts in the final stage of development.

Because trachoma programs have long been in operation in some parts of the country, remarkable results in reducing trachoma and also cataract blindness have been achieved in these specific areas. The Chinese Ministry of Health rewards such counties with the honor of being "A Prevention of Blindness Advanced County." So far there are more than 10 of these counties now in existence. Provinces well known for their successful programs of primary health care are: Heilongjiang, Shanzxij, and Zhojiang.

The above counties must have met the following criteria: blindness data are available through population-based surveys, eyesight is being restored in more than 70 percent of the cases of curable blindness, and there are networks linking all eye-care facilities.

In China most concern regarding cataract blindness is on the currently low surgical output. At the start of the national program

there were only 50,000 operations per year. The Ministry of Health therefore instructed the eye sector to exert every effort to institute a rapid increase in cataract extractions. The goal of 500,000 cataract operations was to be achieved within five years of 1987.

In addition, new programs for the care of the disabled and for the training of ophthalmologists have been given high priority, and better managerial capacity is often the center of annual workshops held at various levels. In China primary eye-care development is the core of blindness prevention activities. The national experiences of success in primary health care creates a favorable environment for prevention of blindness activities. Human resources seem adequate and the commitment of the government is consistent with the development of national programs. This commitment, coupled with the spirit of self-determination and involvement from overseas in finance and technology, should ensure that progress is accelerated.

KOREA

At the start of the national program, Korea's remarkable progress in socioeconomic status demanded a different type of action in blindness prevention. More weight was given to promote better eye health for certain groups of the population. As a result of major action elements identified in 1984, the following have been identified:

1. Primary eye-care services for the rural population;
2. School eye-health programs for schoolchildren;
3. Eye-care elements in maternity and child health during early life;
4. Eye health in the workplace and environmental health; and
5. Eye-care services for the elderly.

Presently there are more than 700 well-trained ophthalmologists taking care of a population of 42 million. The 1988 statistics showed that the newly introduced health insurance scheme had covered 95 percent of the total population. It resulted in 45,000 cataract operations completed under insurance. The country, therefore, is already equipped with sufficient capacity regarding cataract surgery for the whole population and now faces new challenges from blinding posterior segment disorders. The future of the national program

may proceed to the direction becoming part of the scheme on non-communicable diseases control.

VIETNAM

National programs in this country give very promising signs. Strong activities are being extended in all 22 provinces in the north, as well as 13 out of 20 in the south including Ho Chi Minh City. This success has come to be in part because of effective organization with the Institute of Ophthalmology in Hanoi and the Dien Bein Phu Eye Hospital in Ho Chi Minh City playing leading roles. These hospitals link all operational-level prevention of blindness stations at provincial, district, and commune levels and keep activities on going. Health manpower and administration of the health infrastructure are rather well developed in this country.

The blindness rate of the country is known to be 0.8 percent of which the cataract backlog is estimated to exceed 300,000. Provincial operations aim at bringing communes to develop enough capacity for detecting cataract cases. Mobile teams are then sent from the stations down to the communes. Human resources seem to be sufficient and possess enough technology. Great shortages of supplies and equipment prevent the rapid increase of output potential. However the cataract intervention program, which uses the primary health-care approach, is proving to be very workable in this country. Blindness from malnutrition is now covered by a new program of mass distribution of Vitamin A preparations. Ten pilot provinces have just be identified and the program is now being implemented. Vietnam is actually one of the models for this region and thanks WHO and Christoffel-Blindenmission for their consistent support of their programs.

LAOS

National programs are now steadily in progress in the five targeted provinces along the Mekong River. The development of the eye-health system started from zero when the national programs began in 1986 with emphasis on manpower development and establishing eye-care networks. The five provinces now have tertiary centers linked with pilot districts that are served by trained eye staff.

Following WHO initiatives the Japanese Government is com-

mitted to helping develop eye-care systems in Vientiane and Louangphrabang. In several provinces cataract programs are now taking place. In addition, Thailand has extended technical cooperation in various ways, and training opportunities are open to all levels of eye personnel with many options available for selection of courses.

PHILIPPINES

In 1989 WHO helped the Ministry of Health outlined a National Model for the Prevention of Blindness. Emphasis was made to mobilize resources in the private sector, including all professional groups of ophthalmologists in the country under central coordination. A clear objective has been placed on the early solution of the cataract problem, which is estimated to be over 1 million.

Mass distribution of Vitamin A was revived in 1989 under a new nutrition program at the Institute of Nutrition. Regarding eye care, there is a great need for rehabilitation eye units at provincial hospitals. Manpower development needs to be accelerated for the area. To that end the eye sector needs to move further utilizing the principles of primary health care.

SINGAPORE

Singapore has been fortunate in this regard. A small country (570 square kilometers) with a small population of 2.6 million residents and virtually no rural blindness, the present rate of less than 50 blind per 100,000 population (0.05 percent) is amongst the lowest in countries where blindness is reported. Registration of blindness is not required by law, and even allowing for under-registration, the figures are still low. There are a number of reasons for this. Apart from being a small nation with an absence of a rural community, Singapore has enjoyed a rapid industrial and economic growth in the past four decades. The gross national product (GNP) has risen tenfold from $2,189 million in 1960 to $22,846 million and per capita GNP has increased from $1,329 to $11,100 over the same time period.

The pattern of blindness in Singapore has changed considerably over the past 30 years. Keratomalacia, corneal ulceration and ophthalmia neonatorum, which were common in the 1950s, were replaced in the 1960s by glaucoma, optic atrophy, and corneal disease. In the 1970s congenital and developmental causes of blind-

ness emerged with retinal disease and diabetic retinopathy. In the 1980s the five most common causes of blindness were:

Retinal Disease (diabetic and vitreo-retinal degeneration)	29.4%
Congenital and Developmental	20.9%
Glaucoma	15.9%
Optic Atrophy	12.8%
Corneal Disease	6.3%

With the rise in affluence, Singapore is also seeing more monocular blindness from trauma, mostly related to industry and road accidents.

The efficient administrative infrastructure and political stability of this island-nation has allowed development of medical services at all levels both in the public and private sectors. Singapore is fast becoming a center for service within the region, not only for patients but also for presentation of health-related courses and conferences.

In 1990, the government targeted the development of ophthalmology for rapid promotion and inaugurated the Singapore National Eye Center. This was in keeping with Singapore's striving for excellence and emphasizing itself as a global nation. Also in 1990 the government launched the Singapore Vision-Care Program, to foster preventative eye care through mobile eye screening and public education, with the primary objective of detecting and controlling myopia, industrial vision problems, and blinding diseases of the aged.

MALAYSIA

In Malaysia, there is also no legal requirement to register the blind. However, the Malaysian Ministry of Welfare Services, which maintains a register of disabled persons, showed that as of March 1989, there were 100,000 registered blind in this country of 17 million people, giving a blindness rate of 295 per 100,000 (0.3 percent). Figures from the major government hospital in Kuala Lumpur, the nation's capital city, showed that the common causes of blindness were: cataract, trauma, infection, glaucoma, and uveitis.

In keeping with the Malaysian government's stress on rural

development, a prevention of blindness committee of the Malaysia Association for the Blind, with representatives from the relevant government ministries has promoted annual campaigns and mobile eye screening in rural areas. The committee also set up the Tun Hussein Onn Eye Hospital in Kuala Lumpur in March 1986. The latest annual report of the hospital showed a high level of performance targeted toward prevention of blindness by service- and teaching-orientated activities.

The country is now prepared for the start of national programs for the peninsular part of the country. Because rehabilitation has long been very strong in this country, this element seems to have special emphasis. Whereas Sabah and Sarawak need more strengthening in eye-health system development, WHO and Sight Savers are in close cooperation within this country.

The action elements that have been developed especially for the peninsula, may require new dimensions in planning and may become a new model in the region. The health infrastructure of Malaysia is rather well developed, and good inland transport and a better standard of living may also be favorable to the success of the programs. With a thriving economy now very much in evidence, Malaysia should expect to provide high-quality care and self-sufficiency in her blindness prevention programs.

INDONESIA

In 1982 a survey carried out in eight provinces throughout Indonesia, a nation widespread across the Western Pacific with a population of 170 million, showed a blindness prevalence of 1.2 percent. The chief causes of blindness were:

Cataract	76.0%
Corneal Disorders	13.0%
Glaucoma	10.0%
Refractive Problems	0.6%
Retinal Disorders	0.3%

Keratomalacia and trachoma have become uncommon since 1980.

The government's policy to reduce the prevalence of blindness includes integrating eye care throughout primary health care. The

secondary and tertiary health-care systems were included in its five-year development plan for 1984 through 1989.

The operation concept is for eye health for all by the year 2000. This concept is translated into the carrying out of eye care and POB projects through the PEC approach, which will be substantially increased in the five-year plan for 1989–94, and will involve the government, the private sector, and the community.

THAILAND

Thailand occupies 500,000 square kilometers and has a population of 52 million of which 80.0 percent live in the rural areas. Unfortunately, this country has a significant backlog of untreated cataract blind. An epidemiological survey in 1986 revealed 0.7 percent blindness. The chief causes of blindness were:

Cataract	67.7%
Corneal Disorders	10.6%
Optic Atrophy	7.0%
Retinal Disorders	2.7%
Glaucoma	2.3%

The National Institute of Public Health Ophthalmology was established in 1983 to provide coordination of a national plan for the prevention of blindness. The commencement of these prevention activities brought about significant ophthalmic programs. Eye clinics have increased outside metropolitan Bangkok and the number of ophthalmologists has increased from 70 to over 200 and cataract operations have increased from 4,000 per year to 20,000 in 1987 and 30,000 in 1988, when additional surgeries were performed in the provinces to celebrate the King's sixtieth birthday. Thailand hopes to have a marked reduction in its cataract backlog within five years.

BLINDNESS PROBLEMS IN RESOURCE NATIONS IN THE WESTERN PACIFIC

Japan, Australia, New Zealand, and Singapore have eye-care services that are sophisticated and comprehensive. Only small groups within these populations are underserved. However, these countries

increasingly face the problems of the aged blind. As shown in recent studies in Australia and Japan, the majority of blindness is in those over 60. Age-related macular degeneration was diagnosed in 43 percent of those applying for services from blind agencies. The mean age of those applying was 78–79; women outnumbered men three to one, reflecting a longer life expectancy for women. As Dr. Vyas has said, research into irreversible blindness must remain a major task worldwide.

CONCLUSION

Japan, Australia, New Zealand, and Singapore have particularly great potential to contribute resources to the nations of the Western Pacific Region. Both academic departments and ophthalmic professions have become increasingly committed to training and helping to develop strategies to cooperate and assist nations in preventative, curative, and rehabilitation programs in the region. Drs. Nakajima, Konyama, Newland, Taylor, Galbraith, and Lim are examples of the commitment.

In-country programs in the developing nations of the South Pacific Subregion now show potential for developing infrastructure that will allow them to be increasingly self-sustaining. In addition, with the emergence of potential national leaders in prevention of blindness such as Dr. Bage Yaminao demonstrating the inherent strength of many island nations in the southern area of the Western Pacific, the future seems assured. However, funding the right program will remain a problem.

Due to their relative affluence the countries in the Western Pacific can continue in a position of self-sufficiency in their prevention of blindness programs. The WHO and NGOs have helped in the assessment of blindness in early surveys. Using their collective will, governments and NGOs can cooperate to implement prevention of blindness targets that have already been identified. The impact of ophthalmic technology on mass blindness can be achieved by the turn of the century.

PART 4

PLENARY SESSION III

Sustainable Manpower Development for Blindness Prevention

WORLD BLINDNESS AND
ITS PREVENTION
VOLUME 4

1

Ophthalmic Manpower in Sub-Saharan Africa

Dr. Allen Foster

The availability of ophthalmologists varies greatly from one region of the world to another, with approximately 1 ophthalmologist per 20,000 population in North America and Western Europe but less than 1 per 1 million in some countries of Africa.

Two recent workshops have been convened by the World Health Organization. The first, for Anglophone Africa, met in 1988 in Accra, Ghana; and the second for Sub-Saharan Francophone Africa was held in Lome, Togo. Both of these workshops specifically reviewed the current situation regarding ophthalmic manpower for eye-care services in Africa.

OPHTHALMOLOGISTS

Within Africa there is a wide variation from country to country on the availability of ophthalmologists, ranging from 1 per 130,000 in South Africa to 1 per 3 million in Angola. In general, however, in Sub-Saharan Africa there is approximately 1 ophthalmologist per 1 million people in Anglophone and Francophone areas, and 1 per 2 million in Portuguese-speaking countries. Most ophthalmologists work in university teaching hospitals or larger cities. Approximately 25 percent of ophthalmologists working in Sub-Saharan Africa are expatriates.

Postgraduate training programs for ophthalmologists exist in Senegal, Mali, Ivory Coast, and Zaire for Francophone countries and in Nigeria, Ethiopia, Sudan, Kenya, Tanzania, Zimbabwe, and South Africa for Anglophone countries. There is no full-time training program for Portuguese-speaking countries. Approximately 70 ophthalmologists graduate each year from 14 training centers in

Africa: 20 are from Nigeria, which has 6 centers, and 20 from South Africa, which has 3 centers.

Although, in the last 10 years there has been an increase in the number of ophthalmologists being trained in Africa, they still have not been able to keep pace with the increased demand for eye-care services, particularly in rural Sub-Saharan Africa. To help solve this problem, current initiatives include plans to develop a two-year Diploma in Ophthalmology course for Anglophone West-African countries, under the direction of the West-African College of Surgeons. There is also a proposal to upgrade the present one-year Diploma in Ophthalmology course in Zimbabwe to a three-year post-graduate training program in ophthalmology.

Present post-graduate training in ophthalmology in Africa is often based on the curriculum for training programs in Europe. Because of the different ophthalmic disease patterns and the availability of resources, more attention needs to be paid to aspects of community ophthalmology in the training of ophthalmologists for work in Africa. At present, there is no specific training course in community ophthalmology in Africa, but rather, two courses have been developed at WHO Collaborating Centers for Blindness Prevention, one in London at the International Centre for Eye Health and the other in Baltimore at the International Center for Epidemiologic and Preventive Ophthalmology at the Johns Hopkins School of Hygiene and Public Health. These courses are aimed at training ophthalmologists in community or public health ophthalmology with a view to establishing and assisting in the development of national prevention of blindness programs in their own countries.

GENERAL PHYSICIANS/SURGEONS

To promote better eye surgical services in some African countries, general medical doctors have learned how to perform cataract surgery. This practice has been more common in non-governmental medical services than in government systems. The problem with this approach is that, because of the many other demands on his time, the general doctor usually cannot devote enough time to eye-related work to develop a sustainable eye-care service. In some remote area, however, a general physician or surgeon who has learned cataract

surgery may be the only possibility in the foreseeable future for providing cataract surgery services.

OPHTHALMIC ASSISTANT/CATARACT SURGEONS

Because of the inadequate number of ophthalmologists per population, many African countries have now established training programs for ophthalmic assistants to provide eye-care services for a population of approximately 250,000 people. Ophthalmic assistants are usually medical assistants or nurses who have previous general medical or nursing training and who are given a specific one-year training program in diagnosing and managing common ophthalmic problems. Such training programs for ophthalmic assistants or ophthalmic nurses currently exist in Ethiopia, Kenya, Uganda, Tanzania, Malawi, Sudan, Mali, Ghana, and Sierra Leone.

After they have worked for several years, selected ophthalmic assistants who have shown very good judgment and superior surgical skills may be offered a further one-year training course in cataract surgery on a one-to-one basis with an experienced ophthalmologist. This training should include performing at least 100 cataract operations under supervision before being allowed to practice cataract surgery. The training is specifically in intracapsular cataract surgery under local anesthesia using magnifying loupes for uncomplicated senile cataract. Such training of ophthalmic assistants in cataract surgery has been successful in several East African countries including Kenya, Malawi and Tanzania. A program is currently planned for Mali.

SUMMARY

The average ophthalmologist in Africa performs less than 300 cataract operations per year. This amounts to about 50,000 blind cataract patients being operated on per year in Sub-Saharan Africa, with an estimated backlog in excess of 3 million cataract blind and an annual incidence in excess of 500,000 people per year. The present available manpower, resources, and efficiency are therefore providing services for less than 10 percent of the newly blind cataract patients and ignoring the problem of the existing cataract blind.

The major problem related to the development of prevention of blindness programs in Sub-Saharan Africa is the lack of trained

manpower. Although efforts are being made to train more ophthalmologists, it is likely that with the present three-year training program for ophthalmologists in African countries, there will be an insufficient number of ophthalmologists available outside the larger cities in the next 10 years. It is therefore very important that excellent supervised-training programs be developed for ophthalmic assistants or ophthalmic nurses who can provide the basic eye-care services to rural populations in Africa and who may also be trained to deliver cataract surgery services. Consideration should also be given to promoting one-year courses in ophthalmology for African doctors to develop expertise in eye diseases and to specifically train in cataract surgery. Precise needs in the next decade are:

1. Development of regional training centers for ophthalmologists in:
   - Anglophone West Africa
   - Francophone West Africa
   - Central and Southern Africa
   - Portuguese-speaking countries
2. Establishment of one-year training programs in Africa for doctors to train as eye doctors/cataract surgeons.
3. More emphasis given to the training of selected ophthalmic assistants as cataract surgeons in individual countries.
4. Suggested goals for the next decade to be discussed are:
   - One national ophthalmologist per 500,000 population in every African country.
   - One cataract surgeon (eye doctor or ophthalmic assistant/cataract surgeon) per 250,000 population in every African country.
   - A cataract surgical rate of at least 1,000 operations per million population in African countries.

2

Training Doctors in Community Ophthalmology

Dr. Rabiul Husain

Bangladesh is one of the least developed countries with an area of 144,000 square kilometers inhabited by 110 million people with a per capita annual income of $163. Of the many problems confronting Bangladesh in the health sector, the problem of blindness is one of the most important. Unfortunately, various factors, such as resource constraints, lack of skilled manpower, and the physical and social remoteness of existing facilities, contribute to this problem.

The country has a very limited number of ophthalmic resources and there is only 1 ophthalmologist for every 1 million people. The same ratio is true even for ophthalmic support staff. There are a total of 1,500 ophthalmic beds in both government and non-government hospitals. Because of the agriculture-based economy, 80 percent of the population lives in rural areas. However, all of the ophthalmic facilities are located in cities and towns, thus aggravating the situation.

A great majority of blindness can be prevented provided timely and appropriate measures are undertaken and a significant number of blind people can be cured by surgical intervention. Cataract is one of the major causes of curable blindness. According to a conservative estimate, there is a backlog of nearly 500,000 cataract cases in need of surgical intervention. Every year there are an additional 50,000 to 60,000 new cases of cataract, glaucoma, ocular infection, trauma, and nutritional blindness—all of which are major preventable causes of blindness.

With the goal of overcoming the acute shortage of ophthalmic manpower in the country, the Eye Infirmary and Training Complex of the Bangladesh National Society for the Blind embarked in 1979 on a program to train doctors. The Doctors' Training Program in Community-Oriented Ophthalmology was initially to be a one-year course, but it was soon discovered that the trainees needed

more practical experience to make them dependable cataract surgeons. Therefore, a well-designed two-year course was eventually developed under the auspices of the University of Chittagong, which leads to a Diploma in Community Ophthalmology.

First Year:	**Residency Training (12-month duration)**
First Phase (3 Months)	Orientation classes, clinical clerkship, and learning basic clinical skills.
Second Phase (4 Months)	Exposure to operation theater techniques, the outpatient department, and mobile eye camps.
Third Phase (5 Months)	Specific responsibilities in the ward, outpatient department, and operation theater (extra-ocular surgery), plus participation in the mobile school clinic, primary eye-care program, and nutrition rehabilitation program.
Evaluation	At the end of each phase.
Second Year:	**Diploma in Community Ophthalmology Course (12-month duration)**
First Phase (3 Months)	Lectures and tutorials—160 Hours. Practicing clinical skills with inpatients and outpatients and in the operation theater (including intraocular surgery).
Second Phase (4 Months)	Participation in the eye camp program, independent responsibilities in various departments and attending patients.
Third Phase (3 Months)	Independent responsibilities of indoor and outdoor patients, practicing intraocular and extraocular surgeries, and participation in tutorial classes, clinical meetings, and Journal Club meetings.
Fourth Phase (6 Weeks)	Refresher course, final evaluation, and final examination.

Each trainee is to perform and maintain a detailed record of at least 150 cataract surgeries and also 16 cases of common ophthalmic problems presented in the hospital.

Thus far, 79 doctors have received training in community ophthalmology and are actively engaged in the prevention of blindness program in this country.

The success of this program is that in the year 1973 only 1,600 cataract cases were operated upon. However, the gradual increase of trained manpower, including both doctors and ophthalmic paramedics, has resulted in nearly 50,000 cataract surgeries undertaken in 1979 by this organization.

The significant development in this field is that the University of Chittagong has recently marked the success of the program by establishing an Institute of Community Ophthalmology, so that training of doctors in community ophthalmology can be further developed to serve the region.

3

Sustainable Manpower Development for Blindness Prevention

Dr. Moses C. Chirambo

AUXILIARY SUPPORT: OPHTHALMIC ASSISTANTS

A particularly worrisome problem in Sub-Saharan Africa is lack of trained eye-care personnel. In many countries of the region, there is 1 ophthalmologist per 1 million population. Although efforts are being made to train more ophthalmologists, it is unlikely that there will be sufficient ophthalmologists available outside urban areas. It is therefore obvious that ophthalmologists in Africa must delegate much of their routine work to other eye-care personnel who are more readily available. It is also equally important that good training programs are developed for ophthalmic assistants, who can provide basic eye-care services to rural populations.

To overcome constraints inherent to the region, several countries have recognized the need to develop national or subregional training programs for ophthalmic assistants. The ophthalmic assistant is a qualified nurse or medical assistant (clinical officer) who has had several years of experience in medical work before being selected for specific training in ophthalmology.

The training lasts 12 months and consists of instruction in basic sciences, pathology of common eye conditions, epidemiology, how to perform an eye examination, and management of common eye conditions. This training is performed by ophthalmologists who have experience in relevant eye diseases and takes place in established eye units that have a sufficient patient load, adequate facilities, and appropriate training materials.

Upon completion of the training, the ophthalmic assistant is expected to diagnose and manage all common eye conditions, recognize and refer those conditions that require more sophisticated care, organize and run outreach and static clinics, and provide education on primary eye care, including health promotion and prevention

of eye disease. He is also expected to select patients for surgery, perform extraocular surgery, properly use a direct ophthalmoscope, provide tonometry, administer subconjunctival injection, remove foreign bodies, and distribute necessary drugs.

On graduation the ophthalmic assistant is provided with diagnostic and surgical equipment and posted to a district clinic. It is necessary that he or she is supervised and supported by an ophthalmologist regularly. The ophthalmic assistant acts as the link between patients with eye problems in rural communities and the ophthalmologist in the referral centers.

Currently, training programs for ophthalmic assistants have been established in Ethiopia, Ghana, Kenya, Malawi, Sierra Leone, Tanzania, and Uganda. Soon Lesotho and Zimbabwe will establish training programs for ophthalmic nurses. The goals for the future are to develop more ophthalmic training programs for ophthalmic nurses and to reach a target of 1 ophthalmic assistant per 100,000 population. Thus far, the constraints to these goals have included problems in achieving recognition of the program's qualifications, providing sufficient standardization, and the lack of incentives after training.

4

Sustainable Manpower Development for Blindness Prevention: Nepal 1981–90

Dr. G.P. Pokharel

Nepal has a population of 18 million people and an area of 147,181 square kilometers roughly divided into three geographical regions. A vast plain called the Terai has 45 percent of the population and most of the roads with relatively easy access. The hills have 47 percent of the population, and the mountainous region has 8 percent of the population. The country has a literacy rate of 25 percent and a per capita income of $160 per year. The life expectancy is 52 years and the infant morality rate is 108 per 1,000.

Before 1980 the country had 8 eye surgeons with a total of 28 beds to serve a population of 13 million. Approximately 1,500 cataracts were performed every year in the Kathmandu hospital, three rural eye departments, and scattered eye camps. However, in 1980–81 the World Health Organization and the Seva Foundation, with the help of several other donor agencies, joined the Government of Nepal to conduct a blindness survey. The survey's major findings were the following:

1. An estimated 117,620 people (0.8 percent) were blind.
2. 23,610 people (1.7 percent) were blind in one eye.
3. 92.0 percent of the blind resided in rural areas of the country.
4. 80.0 percent of this blindness was avoidable, that is, it was either preventable or curable.

The major cause of blindness in Nepal was found to be cataract, which accounted for 66.8 percent of the total blindness. With the above data in mind, the Government- and WHO-sponsored Prevention and Control of Blindness Project had as its ten-year nationwide program the objective of national self-reliance in ophthalmic care.

To attain this target, the following principal strategies have been employed:

1. Establish eye centers/hospitals in those rural areas that were the least served.
2. Train:
   - more eye surgeons—50 by the end of decade.
   - 200 ophthalmic assistants.
   - district medical officers, paramedics at the Health Post level, and primary health-care volunteers at the village level.
3. Increase the number of mobile camps in which surgery for cataract and trichiasis/entropion are performed.
4. Establish a training program for ophthalmic assistants in Nepal.
5. Conduct field surveys, enacting preventive and curative measures for xerophthalmia and trachoma.
6. Train health post paramedics, village-level primary health workers, and volunteers in primary eye care.

The first group of 46 ophthalmic assistant trainees was selected in 1981 after interviewing 720 candidates. The trainees were selected primarily from remote rural areas so that there would be no difficulty for them to work in rural areas after training.

Three months of intensive theory classes were conducted and every month an assessment was made of the trainees regarding their knowledge. Classes on some subjects were repeated when necessary. Ophthalmologists, physicians, public health specialists, and health-education experts took part in the training. Handouts were prepared and regularly distributed in every class. The curriculum was revised by Drs. Kolstad, Pararajasegaram, Mohan, and Khosla, among others. Prof. Khosla prepared a manual which proved to be most useful. After three months, a final theoretical examination was conducted. Nine of these 46 trainees received a one-year training course at the Aravind Eye Hospital in Madurai, India.

The bulk of the trainees then received on-the-job training for 2.5 years in rural areas. The training consisted of hospital-based training, which includes: 1) diagnosing common eye conditions like cataract, glaucoma, iritis, conjunctivitis, pterygium, chalazion, refractive error, and others; 2) assisting in the operating theater, including

asepsis and sterility; cleaning and autoclaving instruments; using local anesthesia—surface, retrobulbar, and facial; and assisting in surgery; 3) using minor surgical techniques, including entropion/trichiasis, pterygium, and chalazion. Mobile Camp training includes detection and treatment of trachoma, eye-health education, treatment and detection of xerophthalmia, and entropion surgery.

HEALTH EDUCATION TRAINING PROGRAM

Nepal Netra Jyoti Sangh (NNJS), with the help of the Seva Foundation, started a training program in health education in 1986. These trainees were mostly ophthalmic assistant supervisors who were working in rural eye centers. The initial training focused on understanding the eye-care materials to be distributed to those attending eye camps. Along with this program, a nationwide radio program was established that, among other things, announced the dates of upcoming eye camps and discussed topics regarding blinding eye diseases.

In 1988 NNJS established a health education unit with the financial support of Seva. It now has two ophthalmic assistant supervisors who work as senior health educators. This unit has started publication of a quarterly newsletter and eye-health education material on common eye diseases.

Depending on their skills and maturity, several ophthalmic assistants have been trained to perform specific tasks in different eye centers. These include administration management and record-keeping.

The ophthalmic assistants who received the above training have fit nicely into the eye hospital and have performed many different types of jobs. Whenever a person is required for a specific task in the hospital, it is wasteful to routinely use an ophthalmic assistant. Visual acuity testing and other such relatively simple tasks should be relegated to auxiliaries. Ophthalmic assistants and auxiliaries interact effectively with ophthalmologists and periodic supervision has been provided by the latter. Monthly staff meetings are held to discuss programs of mutual concern.

PRESENT SITUATION

All ophthalmic assistants are able to carry out routine outpatient

department (OPD) procedures, provide operation-theater assistance, and organize eye-camp activities. Over 80 percent are competent in routine refraction. Twelve are supervisors who conduct OPD services in rural eye hospitals and district eye clinics. These 12 also perform routine administration and management tasks in the district eye clinics. Three ophthalmic assistants have received further training in community ophthalmology and are directing field programs independently. Two are working on pharmaceutical production of eye drops and a few on manufacturing of glasses. Finally, one has become a maintenance engineer of ophthalmic instruments and equipment.

Along with the progress in this category of manpower development, the country now has 45 ophthalmologists, 13 rural eye hospitals (with 728 eye beds), and 12 district eye clinics. More than 27,000 cataract operations are performed every year through the combined efforts of the eye centers and mobile teams. This increased productivity in Nepal as compared to other countries in the region has been largely due to the hard work, skills, and efforts of the ophthalmic assistants.

CONCLUSIONS

1. Although it can vary from center to center, ophthalmic assistants are able to perform at least 60 percent of the tasks of ophthalmologists in rural centers.
2. For any expansion and implementation of a field program on prevention of blindness, this type of manpower is absolutely necessary.
3. Career development opportunities and continuing education must be provided.
4. Curriculum and training manuals should be required by the country concerned.

5

Development of Management Personnel in Blindness Prevention

Mr. R.D. Thulasiraj

INTRODUCTION

In a program that addresses public health issues, the emphasis needs to be on program management. The clinical or medical aspect of the intervention is normally a well-established procedure, for example immunization or cataract surgery, and there is little reason to change the basic design of the medical intervention. However the delivery of the intervention and its organization will need to be adapted to suit the public health need. The real challenges come in social marketing to create a demand for services, generating resources, getting organized to meet the demand, taking care of logistics, evaluating the program's effectiveness, analyzing successes and failures, planning, developing manpower, and seeing to a host of other issues. All of this requires knowledge and skill that are quite different from treating a patient who has come to the hospital on his or her own initiative. As the emphasis on the community-oriented approaches increases, the need for this type of manpower, with program management expertise, becomes more critical.

ISSUES IN HEALTH MANAGEMENT TRAINING

Though there is a need for management specialists in any large public health program, there cannot be a clear demarcation of the management function between clinical and non-clinical personnel. Some of the clinical personnel, especially those at the senior level will need to possess considerable managerial ability to make the team work better.

This raises an important issue of who should be in charge of a program. In the Asian context, and probably most others, the ophthalmologist is looked upon as the leader of the program.

Whereas it may not be efficient to perpetuate the present practice of using the ophthalmologist as the program manager, the reality that this is often the case will need to be recognized in the training and positioning of health management personnel.

Apart from the above external perception, there is also an internal perception among ophthalmologists that they should be in charge because their medical education is considered superior to other training. These perceptions are further reinforced by the tradition of medical doctors becoming, often through seniority, the heads of hospitals and health-care programs. In instances where professional managers have been placed in senior or parallel positions to the doctors, there has often been conflict that negatively affected the program.

Another dimension to the proper development of health management personnel is the environment of health management in the country and the level of its sophistication. This is particularly important because we have to recognize that the training must be appropriate to the needs, culture, and the working environment of that particular country.

In India and most developing countries the management role in health is perceived to be at a very low level and is often limited to following routine procedures, many of which were established many years ago. Supervisory skills at the departmental level, such as medical records, housekeeping, stores, and finance, are also in need of considerable improvement. Concepts of social marketing, operations research, scientific human resource development, and strategic planning processes are usually nonexistent. The development of health management personnel needs to reflect these needs.

CURRICULUM

Curriculum development needs to be viewed within the framework of the reality described above. For senior clinical personnel there needs to be a process of sensitization and appreciation of managerial inputs. For health management personnel the curriculum and training philosophy should reflect the relevance and appropriateness of the country's needs.

MANAGEMENT PERSONNEL IN EYE CARE

Whereas the clinical aspects of curing and treating ocular morbidity

has been well developed, its delivery to the masses, using an appropriate methodology and technology at an affordable price, still remains a major challenge.

To meet this challenge, management training will need to be implemented at the following three levels: ophthalmologists and clinical personnel, senior program managers, and supervisory personnel.

Ophthalmologists and Clinical Personnel

The management process is a team effort even when there are separate administrative personnel charged with that responsibility. To this end the clinical personnel need to be sensitized to the management process and gain a reasonable understanding of it. Exposure to the elements of social marketing, such as epidemiology and social behavior, will give the clinical staff an understanding of the magnitude of the blindness problem and the problems involved in delivering eye care to them. This exposure ensures greater involvement of the clinical staff and development of an appropriate social marketing process. The same kind of benefits can be gained from their exposure to operations research approaches to increasing internal efficiency and other management processes.

Senior Program Managers

The training of senior management personnel will need to focus on two broad areas: external environment and internal resources.

External Environment

The management of the external environment consists of:

- Social marketing, which involves knowing the magnitude and characteristics of the problem, as well as relevant behavior patterns, economic issues, and logistical issues. The training tools appropriate to provide the necessary skills and knowledge include: core epidemiologic principles, epidemiology of blindness, basic biostatistics, health behavior, health education, and health economics.
- Resource mobilization, which involves both financial and human resources, depends on the character, scope, and size of the program. Specific skills and knowledge that are useful

in this area include: financial planning and management, national blindness policy and funding, the role and available funding opportunities of international NGOs in that nation, and human resources development and manpower planning.

Internal Resources

Management of resources is a vital process in developing countries due to their scarce availability. The main resource categories include manpower; physical facilities such as beds, operating rooms, and equipment; and money. The training should include the following subjects: operations research, basic principles of industrial engineering, maintenance management, accounting and budgetary control, inventory management, personnel management, and understanding of support departments such as housekeeping and medical records.

Supervisory Personnel

Within an eye-health program, specialized supervisory skills are required in several areas, such as medical records, stores, housekeeping, computers, accounts, out-reach coordination, and health education. In certain countries such personnel are readily available, but in others they need to be trained.

Although three levels of management training have been identified, three levels of personnel are not always necessary. The level and number of personnel depends entirely on the size of the program. For instance in small programs the program management and several supervisory roles could be handled by one person. Whereas in large programs it is possible that there must be several senior program managers, each handling a specialized function under an overall coordinator.

TRAINING PHILOSOPHY

Because the immediate need is for manpower that can manage programs efficiently, the training program needs to be applications oriented. The managers will also need to establish a conceptual framework so that there will be no conflict between long-term objectives and short-term achievements. Such training can be accom-

plished through a careful blending of classroom teaching in a practical setting where the students can consistently apply what they are learning.

However, there is the pitfall that such a training course could result in strong supervisors who nevertheless have poor entrepreneurial skills, which are very vital for continued excellence of any program. This can be addressed very effectively at the selection stage and later during training by involving the students in projects that call for strong developmental activity. An outcome-oriented approach with an emphasis on problem solving during training will help to develop good managers.

CONCLUSION

The management training process for eye-health program must reflect program needs and the health management culture. Although it is necessary to teach general subjects, such as epidemiology, biostatistics, and operations research, it is even more important to make them specific to the country's needs through an appropriate practical setting.

6

Management of an Eye-Care Program in a Developing Country

Mr. Samuel K. Tororei

INTRODUCTION

I believe that the greatest challenge facing us as providers of eye-care services in this decade is the need to manage an ever-diminishing amount of resources to provide for an ever-increasing demand for our services. Difficult choices must be made at every turn, with the knowledge that the decisions of today will affect the outcomes of tomorrow.

It is therefore necessary to develop programs that are sustainable, and the surest way to make a program sustainable is to design sound management and administrative procedures and organs. These procedures and organs must be adequate for the needs of today, while being forward-looking enough to be ready for the challenges of tomorrow.

In answer to the question of how we can best manage our eye-care programs, I argue that the best alternative at our disposal is the national Prevention of Blindness Committee, which has demonstrated its usefulness in Kenya for the last quarter of a century.

The observations contained here are entirely mine, and in no way represent the views of the Kenya National Prevention of Blindness Committee or the Kenya Society for the Blind.

A HISTORICAL PERSPECTIVE

In the 1960s and 1970s, the importance of eye-care programs, particularly at the national level, gained increasing recognition, among non-governmental organizations, as well as among national ministries of health, who soon realized the fruits of organized provision of both preventive and curative eye services. Eye-care programs provided a meeting point between various eye-health providers, which

soon led to the formation of a national Committee for the Prevention of Blindness in countries that did not have them or this Committee's reappraisal in countries that did.

This process gained momentum as the international agencies interested in eye care rallied behind the banner of the International Agency for the Prevention of Blindness, which was formed in 1975 in official relationship with the World Health Organization. In turn, the World Health Organization added its voice to the need and desirability of national eye-care programs, particularly within the context of primary health care. Thus, as the 1980s were ushered in with such momentum, the United Nations announcement that 1981 would be the year of disabled persons, and subsequently that the rest of the decade would be dedicated to disabled persons, prevention and cure of blindness was no longer a matter only for NGOs but also for governments and the United Nations system.

As their significance increased, so did the size of eye-care programs, and soon it was necessary to deal with important management issues. The purpose of this paper is to discuss the most salient management issues likely to be encountered during the operation of an eye-care program in a developing country and to emphasize the need for a practical approach to the resolution of management conflicts. Extensive use will be made of the Kenya experience. However, reference will be made to many other African programs with which I have come into contact through the joint meetings of the national committees for the prevention of blindness of East African countries and the Non-Governmental Forum for East and Southern Africa, a group that brings together societies for the blind in those areas of Africa. Although the examples used in this paper are from Africa, I believe other developing countries will find them applicable to their circumstances.

ORGANIZATIONAL AND ADMINISTRATIVE STRUCTURE

Eye care is part of the general health program of any country and is therefore subsumed under whatever ministry is responsible for health. However, in the overall order of priorities, eye care is not always at the top in any ministry of health because ministries and indeed governments all over the world are more concerned with problems of life and death. Usually blindness does not fit into that

category. Eye care must therefore fight for its share in the ministry's resources from a disadvantaged position.

Providers of eye care within and outside the ministries of health are very conscious of this problem; and this may explain why in many countries, eye care is the only health service with a five-year plan or an established committee. (This was certainly true of nearly all countries before the advent of AIDS in the past few years.) Thus, it is my contention that by reason of its priority status, eye care demanded a radical approach, which we in Kenya took advantage of as early as the mid-1960s and which the rest of Africa adopted in subsequent years.

The major results were:

1. The non-governmental organizations (NGOs) were accepted by the ministries of health as important partners and were therefore incorporated into the ministries' policy-making organ. This makes the participation of the NGOs interested in eye care different from the participation of those engaged in other sectors that usually tend to go it alone or at best develop tentative relationships with the ministries of health.
2. The chief NGOs interested in eye care were willing to put their resources and skills at the disposal of the ministries of health and to treat this as a health arrangement between more or less equal partners. In turn, the ministries allow the NGOs to participate not only in policy formulation but also in policy implementation.
3. The partnership is still in the process of developing in some countries, which has been built on these two factors. In countries where the process has been completed, for example in Kenya, Tanzania, and Uganda, the partnership between the ministries of health and the major NGOs has been formalized through the national Prevention of Blindness Committee. Such committees provide for power-sharing between all parties concerned, with the ministry of health clearly having the final say but with NGOs wielding substantial influence at all levels of eye-care service delivery.

The Prevention of Blindness Committee is by far the best management organ for a national eye-care program and should therefore form the central pivot around which the eye-care program will revolve. How this might be accomplished must now be addressed.

The national Prevention of Blindness Committees are organized as follows:

1. Membership is by organization rather than by individuals. Each organization is represented by persons in a position to make binding decisions on behalf of their organizations. This avoids the need to constantly have to make consultations with senior officers. This also allows the national Prevention of Blindness Committee to be an efficient management tool and enables it to fulfill any management role assigned to it.
2. The Committee is chaired by a Minister of Health. Because it is mandatory for all organizations to send senior officers to the Committee, the ministries of health usually oblige by sending officers at the level of Deputy Director of Medical Services or higher as chairman to the Committee. It is not always possible to ensure that this officer is an ophthalmologist, nor is it always desirable that this be the case. Therefore, the chairman is usually advised by the government's Chief Ophthalmologist and other officials. By virtue of the seniority of the chairman and his Ministry colleagues, the Committee's decisions are more likely to receive the Ministry's approval than would be the case otherwise.
3. The Committee's secretariat is provided by the nongovernmental organization sector. This is usually done through the National Society for the Blind, which not only provides the secretary to the Committee, in the person of its chief executive or an officer designated by him, but also the physical office space and administrative backing for the program. This gives the Committee administrative flexibility.
4. The professional workers are represented in a subcommittee, which deliberates on all professional matters on behalf of the main Committee. Representation is organized in such a way as to ensure the widest participation by all categories of eye workers, without overloading the Committee with numbers.
5. Organized as stated above, the Committee is able to require all parties interested in eye care to inform it of their projects and thus be able to oversee the entire ophthalmic program in the country.

Before attempting to establish a prevention of blindness committee in your country, you may wish to consider the following questions:

1. **Is there a Ministry of Health in your country?**

   A strange question perhaps, but nonetheless important to consider. Experience has shown that it is undesirable to bypass the government in the development of any national program, if that program is to achieve the greatest success. The central Ministry or Department of Health must be charged with the overall responsibility for the national eye-care program. This Ministry will be the backbone of a workable program; other parties will only supplement what the government does. This ensures that the program remains truly national, not private. In large countries like Nigeria it is argued that this requirement would be impracticable. However, this need not be the case because the highest health authority, in this case the federal Ministry of Health, can still take responsibility and delegate whatever powers it deems to state health authorities, just as it does with other programs.

2. **Must the administrative machinery, the national Prevention of Blindness Committee, always be at the Ministry headquarters?**

   Yes, it is advisable. It is at the Ministry headquarters that health policies are made and where resources are shared. In addition, we have demonstrated the need for the Ministry of Health to assign a senior officer to chair the Committee. This can only be practical if the Committee is centered at the Ministry headquarters. In the case of very large states, a state Prevention of Blindness Committee can be established as a subcommittee of the central Prevention of Blindness Committee. In such an instance, communication channels between the subcommittees and the central Committee must be designed to provide a clear link between the two management levels. Kenya's Prevention of Blindness Committee has made both the chairman and secretary of the Professional Subcommittee members of the national Committee. Similar representation links could be employed between central Committees and state subcommittees. In this case, the state sub-

committee would perform the tasks now performed by the Professional Subcommittee in the Kenyan scenario.

3. **Can the secretariat be provided by the Ministry of Health?** In theory this would be the ideal situation. Experience has shown however, the Prevention of Blindness Committees achieve more flexibility and command more NGO confidence when the secretariat is vested in the National Society for the Blind. This presupposes that such an organization exists in the intending country. This is not always the case. In fact, the Ethiopian program is run as part of the Ministry without much involvement from the National Association for the Blind. The same situation obtains in a general way in Zambia. The point to note is that in the absence of a National Society for the Blind, or in a situation where such an organization exists but is unwilling or unable to perform the task of secretariat to the eye-care program, the second best alternative is to develop a secretariat service within the Ministry of Health, usually by making the eye-care program a separate program with its own manager or director as Ethiopia has done. The program manager or director would then assume secretariat responsibilities on behalf of the program.

4. **Is it necessary to include the NGOs? If so, to what extent?** Each country has to decide whether or not to take advantage of what the NGOs can offer to the eye-care program and the terms under which to accept this. Experience in Kenya, which spans over two decades seem to point to the fact that NGOs bring to the ophthalmic program—and indeed to the rest of the Health Service—much valuable expertise, backed with flexible resources. These resources enable the Ministry to fill the gaps left by an inability to mobilize adequate government resources, or alternatively, ministries use NGO resources to meet unexpected or short-term needs.

   In Kenya, for example, the eye-care program has managed to expand rapidly because of inputs from various NGOs, whose contributions include the construction of eye departments in provincial and major district (government) hospitals, equipping of all government eye clinics in the country and subsidizing of the National Eye Drops Production Unit, to

name but a few. It is therefore clear that NGOs can be made useful allies of the national eye-care program, but it must be borne in mind that NGOs form a powerful interest group which cannot be ignored. Their interests must be taken into account when deciding membership to the managing organs of the program. Ministries of health must also make general rules of conduct through the managing organs of the program, which should be binding to all interested in participating in the eye-care program. NGOs should be encouraged to view their participation in the eye-care program as supplementary and hence subordinate to the Ministry of Health. In turn the Ministry of Health should lend a sympathetic ear to NGO concerns whenever these are raised. The proper management of the program relies on the establishment of mutually acceptable working partnerships between the ministries of health and the NGOs.

Another subsidiary issue is whether international NGOs should be allowed to participate or whether participation should be vested only in national or local NGOs. My considered opinion is that the category of NGO does not matter. The primary qualification is whether or not the NGOs aspiring for participation is engaged substantively in the provision of eye care in the country. Because it is not expected that all NGOs contributing to the eye-care program must participate in the managing organs of the program, each country must define what NGOs should fulfill before they can be allowed to represent the wider NGO community on the managing organs. (A pointer would be to insist on representation of, and from the major organizations interested in eye care. This would exclude the very small or one of the contributors whose interests would be represented by the more substantial contributors.) The program can also design a form of representative rotation, with NGOs serving for a period of time and then allowing others to take their place. Whatever method is chosen, care must be taken to ensure that NGO representation is balanced and satisfactory.

5. What powers should be vested in the managing organ of the eye-care program?

The managing organ of the national eye-care program is the

national Prevention of Blindness Committee. It should therefore be vested with powers to enable it to carry out all the managerial tasks required by the program. These would include:

- Power to act as an executive arm of the Ministry of Health. This means that the Ministry will accept the decisions, recommendations, advice, or proposals of the Prevention of Blindness Committee as part of the outcome of its own authority and not view these as though they came from an outside agency. The Ministry must therefore define areas of the Committee's authority in the Committee's terms of reference. These terms of reference must also clearly set out the limitations of the Committee and the procedure to be followed when these limitations are reached.
- Power to allocate resources within the ophthalmic program. We have noted that the program receives resources from the Ministry and from NGOs. The Prevention of Blindness Committee must be empowered to receive and allocate these resources so as to ensure that all sectors of the program and the country get an adequate share of available resources. This would imply that the Ministry would take seriously the Committee's recommendations of staff deployment, acquisition and distribution of eye medicines, acquisition and distribution of surgical and diagnostic instruments, appropriate equipment for various categories of eye workers, and so forth.
- Power to oversee and regulate the entire program. The Committee must be empowered to regulate the whole ophthalmic program. Thus the Committee should have power to decide the rate of the program's expansion, both vertically and horizontally. For instance, the Committee should regulate the establishment of new cadres of eye workers as well as the establishment of eye-care programs in new geographical locations.
- Power to monitor and regulate manpower training. The success of any eye-care program will largely depend on the quality of its workers. The Committee should be

empowered to ensure that training programs for these workers are of an acceptable standard. This may be accomplished through constant monitoring of the preservice and in-service training programs.

- Power to formulate the program's policy. The Committee must be empowered to formulate the eye-care program policy within the general guidelines of the overall health policy in the country. The Committee would normally perform this task through a five-year development plan or other instruments of policy. The policies so formulated should receive full Ministry backing and in fact should be incorporated into the general Ministry of Health overall program.
- Power to evaluate the eye-care program. Of all the powers that the Committee must have if it is to run the national eye program, the most important is the power to evaluate the program, and by extension, itself. The cornerstone of a dynamic program is its ability to renew itself through periodic self-examination. This process enables the eye-care program to respond to changing needs and circumstances in a planned and orderly manner. The Committee should evaluate the eye-care program constantly with a view to improving its performance.

Possible obstacles in the establishment of a managing organ might include the following:

- Bringing all parties together. A good managing organ is an alliance between the Ministry of Health, the National Society for the Blind, other national and international NGOs interested in the provision of eye-care services, and manpower-training organs within and outside the Ministry of Health, for example the national university or universities engaged in the training of ophthalmologists. It is not always easy to bring all these organizations together to make them subscribe to a common set of rules of conduct. Each organization, or even sub-sector of the same organization, has

different perceptions that may not be in agreement with the needs of the Prevention of Blindness Committee.

- Gaining recognition for the Committee. Even when the national Prevention of Blindness Committee has been set up, it is still necessary to build acceptance not only among its members, but also among all those individuals and organizations involved in the provision of eye care both within and outside the "official" or Ministry program. It takes time to achieve a definitive status. In the process program managers must endure much uncertainty and many anxious moments when at times the whole purpose of the Committee is called into doubt and a collapse of the program seems imminent.
- Resolving conflicts of interest. As with all partnerships, each partner brings into the managing organ its own views. For instance, the Ministry of Health may feel that a certain NGO input should be directed to some aspect of eye care that the concerned NGO is not interested in, for example construction of an eye clinic when the NGO wants to do a series of eye camps. The Committee must find ways of compromising through mediation. To some extent, conflict can be minimized by writing an eye-care program plan that defines priorities and sets out a timetable for each aspect of the program in clear terms. In this way, NGOs will be able to decide where they fit, and the Committee can then enter into discussions with individual NGOs to get them interested in underserved aspects of the program. It is advisable to ask all NGOs to make a commitment to work within or through the national Prevention of Blindness Committee, and in turn to ask the Ministry of Health to be flexible without being indecisive when dealing with NGOs. In other words, partnership between the Ministry and NGOs should be based on mutual trust and understanding.
- Acquiring suitable managers. The whole concept of setting up a managing organ for the national eye-care program relies on the availability of able managers. In general terms, the managers of an eye-care program

managed through a national Prevention of Blindness Committee consist of the Committee chairman and the Committee secretary. In some cases, a program coordinator is appointed to strengthen the link between the Committee and the actual program. But generally, the key national managers are the chairman and the secretary. It is imperative that the Ministry of Health appoint not just a senior officer to chair the national Prevention of Blindness Committee, but that the officer so appointed be one who has a personal interest in the Committee and the program and who would therefore be committed to this duty.

- Establishing contacts with the program. Once the Committee has been established and is functioning, it is necessary for it to set up administrative procedures which link it with the rest of the program. One administrative system is a subcommittee, or a number of them, depending on the circumstances of the country concerned. The functions of these subcommittees must be clearly stated, otherwise the central Committee may not benefit from their input. The subcommittees should, whenever possible, be represented at the central Committee. Requiring subcommittees merely to submit minutes of their deliberations is not adequate.

- Attracting sufficient resources. No program can function without financial and human resources. One of the first challenges that must be overcome in establishing a management structure for a national eye-care program is the need to attract sufficient resources required both by the program as a whole and by its administrative machinery. Governments have proved invaluable in supplying trained medical personnel for the program, and in attaching these to the program at their own expense. NGOs have proved invaluable in providing such resources as vehicles for the program and finances to "lubricate" not just the administration of the program but perhaps even the entire program. Each intending country must find ways of taking advantage of these resources as best as it can.

CONCLUSIONS

This paper has set out broad practical steps I believe are necessary in the establishment of a managing organ for a national eye-care program. I believe that the best managing organ so far demonstrated is the national Prevention of Blindness Committee. Such a Committee should be provided with sufficient power and endowed with adequate administrative procedures. Only then will a national Prevention of Blindness Committee become a reliable management organ. I also believe that all countries should establish such a Committee and that those who already have one should strive to improve their Committee so that it will be able to meet new challenges.

PART 5

PLENARY SESSION IV

New Developments in the Control of Major Causes of Blindness

WORLD BLINDNESS AND
ITS PREVENTION
VOLUME 4

1

Developments in the Control of Cataract: Epidemiology and Clinical Research

Prof. Gordon J. Johnson

INCIDENCE

From random population-based surveys, we now have quite good figures in a number of countries for the prevalence of blindness or severe visual impairment caused by blindness—that is, the numbers requiring attention at the time of the survey. For example, in the Gambia there were 5,500 blind people out of a population of approximately 800,000; this is the equivalent of about 7,000 blind persons per 1 million in Africa.[1]

But how many new cases of blinding cataract are being added to the pool each year? What is the incidence of blinding cataract. Until recently, there was virtually no information regarding the rate at which new cases were occurring, and without such information, it is difficult to project the future requirements for cataract services in any given community. There are two ways of arriving at such an estimate of incidence: by direct measurement and re-examination of the same sample of the population after an interval of time, and by calculation from age-specific prevalences.

In Central India, Drs. Darwin Minassian and Vijay Mehra took a random sample from 19 communities of 1735 people age 30 and over in 1982.[2] In this sample 1655 people were at risk of going blind. They were reexamined four years later for evidence of blinding cataract, to give for the first time direct estimates of the incidence of blindness from cataract in each five-year age cohort. Assuming these communities are representative of India as a whole, they indicate that an estimated 3.8 million persons become blind in both eyes from cataract each year in India—a figure far higher than previously suspected.

The City Eye Study in London has measured the incidence of

new lens opacities and visual reduction from cataract in a cohort of 1029 volunteers around retirement age. This was compared with the incidence calculated from the formulas applied to the Framingham Eye Study by Podgor, Leske, and Ederer[3] and was found to be twice as great (Bamford N, Ehrlich D, not yet published).

Another formula has been developed which takes into account loss of people from the study by differential mortality.[4] This new formula gives figures much closer to the directly measured incidence in London. Further work in this area is required. It would clearly be of great value, saving time and money, if reliable incidence data could be derived from well-conducted prevalence surveys.

In Western countries we have an idea of the number of cataracts being operated on each year by the health services, but we do not know how many remain undetected and untreated, and we have little reliable data on prevalence and incidence. In one sample of a pilot study examining all those over 65 years of age in two group practice lists within the inner city in London, 12 percent had cataract that was suitable for surgery and had not yet been referred (Wormald R, Courtney P, not yet published). Much untreated cataract was similarly found in a rural Appalachian community in the USA.[5]

CAUSATION

The results of three major case-controlled studies in New Delhi,[6] Boston,[7] and Parma[8] in Italy into the aetiology of cataract have either recently been published or are just becoming available. In these studies the "cases" are usually people presenting to the hospital with cataract. The "controls" are people of the same age and background who have other conditions.

From these studies a large number of factors—personal, behavioral, nutritional, biochemical—have been found to be associated with cataract. However, there are variable results and inconsistencies between the studies, and the relative risks are frequently low, of the order of 1.2–1.6. It is not at all clear whether they have any causative significance.

Four associations with cataract stand out fairly consistently:

1. Low socioeconomic status and low education;
2. Low height, weight, and body mass index, associated especially with nuclear cataract;

3. Diabetes; and
4. Use of steroids associated with posterior-subcapsular cataracts.

In Boston there were also biochemical changes which went along with poor nutrition, including low dietary intake of riboflavin, vitamins A, C, and E, and iron, niacin, thiamin, and albumin. The regular use of multivitamin supplements was protective. But associations with nutritional variables apparently did not show up in Parma.

Two recent publications have implicated cigarette smoking as a risk factor. In the City Eye Study in London there was a relative risk of 2.9 for current heavy smokers and nuclear cataract.[9] From Baltimore came a report of a significantly increased risk of pure nuclear cataract and cigarette smoking in fishermen.[10]

There is further evidence of dehydrational crises being a risk factor in India, this time in a longitudinal study. From the same cohort study there has now emerged a 2:33 greater hazard of death in patients with cataract. This does not occur with other causes of visual loss, and is still present with even minor degrees of lens opacity, without significant visual loss (Minassian DC, Mehra V, not yet published).

There have been previous suggestions, in four papers from the United States and one from Britain, of an increased mortality associated with surgery for cataract.[11,12,13,14] The observation from Britain that there was no correlation between the age of patients at surgery and the interval until death suggested that the development of cataract reflects an aging process in the patient as a whole.[15] The study from India, however, is the first evidence that cataract per se is associated with raised mortality; this lends further weight to the presumption that the excess of cataract cases in India is related to major disturbances in general health status.

Long-Term Follow-Up of Cataract Surgery

For around 80 years, and with the investment of millions of rupees, pounds, and dollars, eye camps have been conducted on the Indian subcontinent. There has been no thorough evaluation of the long-term results in terms of the visual acuity, rate of complications, or quality of life. The success rate is usually given in terms of what is seen at the six-weeks postoperative visit. Because of the skills and persistence of the medical assistants working on this project, Vijay

Mehra and Angela Reidy have been able to achieve a 100 percent follow-up rate at one year, comparing rural eye-camp surgery with surgery in a base hospital by the same surgeon. The pooled eye-camp sites had a very slightly increased rate of poor vision, but the difference was not significant.[16]

The worst results were seen when someone came for a short period to help at an eye camp. The good results, comparable to those in the hospital, were only achieved by an ophthalmologist experienced in rural surgery.

More follow-up data are required, both from the developing and the industrialized world, if possible for periods longer than one year.

Clinical Trials of Different Types of Surgery

A workshop organized by the IAPB and the National Eye Institute (Bethesda, Maryland) in Kathmandu, Nepal, in November 1989 looked at "operations research in the control of cataract blindness in the developing world." At the end of the meeting the delegates were asked to vote on what they thought were the most important subjects for operations research, in order of priority. The first two topics received substantially more votes than the later ones:

1. Conduct randomized controlled clinical trials in developing countries using experienced surgeons and techniques appropriate to the setting to evaluate extracapsular surgery with IOLs and intracapsular surgery with eyeglasses, including evaluation of complication rates, patient satisfaction, time, and cost.
2. Identify the barriers that stop patients from obtaining surgery.
3. Gather additional data on prevalence and incidence.
4. Evaluate the alternatives to current delivery systems, including the use of outpatient surgery in Cataract-Free Zones in Latin America, eye camps in Asia, and ophthalmic assistants to perform surgery in Africa.
5. Determine what constitutes patient satisfaction and why some people do not wear their aphakic glasses.
6. Determine what the community believes is needed in the field of prevention of blindness.

Although we know that excellent results can be obtained with extracapsular surgery and IOLs under optimal conditions, it is necessary to know (before we can make recommendations for widespread application) what the comparative blinding complication rates and costs are between IOL surgery and routine ICCE in typical situations in developing countries.

Preparations are being made at present for randomized clinical trials in two suitable locations. It is essential that the patients can be recalled for follow-up at one year, and ideally for at least three years to include many of the cases of capsular thickening and corneal decompensation.

There has also been a recent initiative from Norway with Dr. David Apple in the United States for a controlled trial of intracapsular cataract extraction, with and without insertion of an anterior chamber (AC) lens. The new generation of AC lenses are thought to cause many fewer complications than the earlier models. It certainly would be an easier technique in most situations than posterior chamber implantation, and would not require the same magnification or use of irrigating fluids.

CONCLUSION

In summary, present work is addressing the important questions of:

1. How many people go blind each year from cataract?
2. What causes lens opacity and how may we prevent its development into a blinding lesion?
3. What is the safest and most cost-effective way of providing patients with acceptable cataract surgery?

I hope in four years time we will have more information on these important questions.

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2

Economic Aspects of Cataract Blindness

Dr. Michael F. Drummond

INTRODUCTION

It is important to study the economic aspects of health-care programs because resources are scarce. They are relatively limited when compared with the potential uses to which they can be put. This means that when a given resource is used in a particular activity, the community forgoes the opportunity to use the same resource in its best alternative use. Economists define the (opportunity) cost of a resource as the benefits that it would have generated in its best alternative use. Therefore, the evaluation of health-care programs requires assessment of both costs and benefits. The most efficient allocation of resources would be the one that maximizes the total benefits to the community from the resources at its disposal.

In considering cataract blindness, an efficient allocation of resources would require that:

- the appropriate amounts of resources are devoted to cataract surgery when compared with those devoted to other health-care programs; and
- the resources devoted to cataract surgery are used in the best possible way.

The objective of this paper is to explore these issues using examples from both the developed and developing world.

EVIDENCE FROM THE DEVELOPED WORLD

Value for Money from Cataract Surgery

In a recent paper, Drummond[1] assessed the relative value of money from cataract extraction when compared with other health-care programs in order to determine the relative priority that the operation should receive. In the developed world it is becoming increasingly

popular to calculate the cost per quality-adjusted-life-year (QALY) gained from different health-care programs.[2,3] The logic is that a relatively higher priority should be given to interventions that generate improvements in health at a relatively lower cost (see Table 1).

Drummond made estimates of the cost per QALY of cataract extraction by using cost data obtained in an earlier study[4] and by making several additional assumptions. If it were assumed that cataract operations were performed on individuals with approximately 10 years life expectancy, and that this would improve their quality of life during their remaining lifetime, the costs (in 1989–90 prices) of the initial treatment and 10 years after care would be £21,200. Based on calculations made for the health state "being blind or deaf or not able to speak," Drummond calculated that the quality of life with advanced lens opacity would be approximately 0.6 (better than being completely blind) and that the quality of life after cataract surgery would be 0.9 (lower than completely healthy), this would represent a quality gain of 0.3 in each of the 10 years. Calculating the incremental cost per QALY would give a figure, in 1989–90 prices, of approximately £2750 per QALY gained (discounting costs and benefits occurring in the future at 5 percent per year). This compares relatively favorably with many of the interventions shown

TABLE 1.
Cost Per QALY Gained for Selected Health Care Interventions (£, 1989–90 Prices)

GP advice to stop smoking	260
Hip replacement	1,140
CABG for severe angina LMD	1,590
GP control of total serum cholesterol	2,600
Breast cancer screening	5,340
CABG for mild angina 2VD	19,250
Hospital haemodialysis	21,500

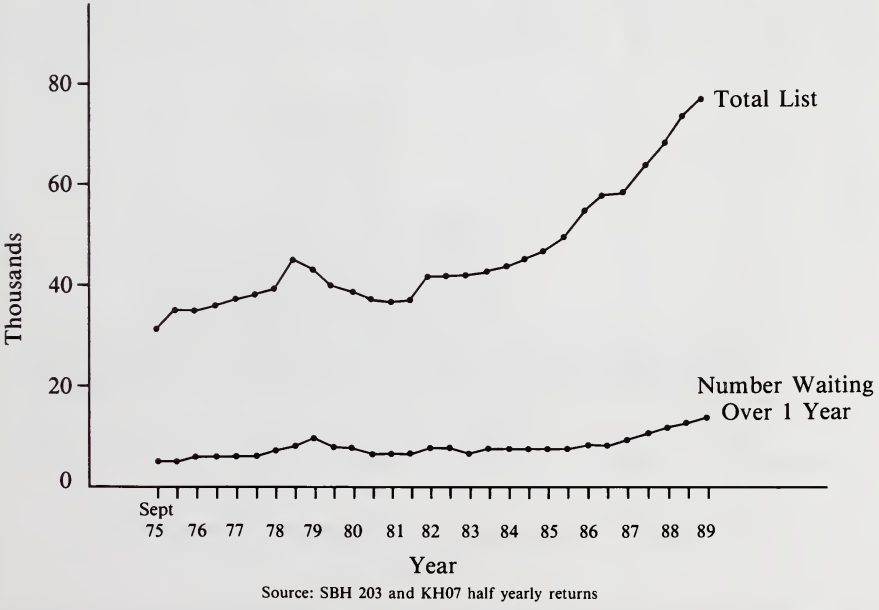
Adapted from Williams (1985).

in Table 1, and several more pessimistic assumptions could be made before cataract extraction were to become poor value for money.

Clearing the Cataract Backlog in the United Kingdom

Despite the apparent good value for money from cataract extraction in the United Kingdom, there are still significant waiting times for treatment. Thus, the cataract backlog is not only a phenomenon of the developing world. Drummond and Yates[5] estimated that there were 74,000 patients in total on ophthalmology hospital waiting lists in England in the first quarter of 1989, of which approximately 75 percent were cataract cases. Moreover, the number of ophthalmology cases waiting over one year was 12,500 (see Figure 1). Whereas in 1976 ophthalmology lists represented only 6 percent of all patients waiting for treatment in England, in 1989 they represented around 10 percent of all patients.

In examining the reasons for the backlog, Drummond and Yates



Source: SBH 203 and KH07 half yearly returns

Figure 1. **Ophthalmology in-patient waiting list—England 1975 to 1989.**

point out that there is currently a shortfall of around 225 consultant ophthalmologists in England as defined by the College of Ophthalmologists' own standard. There may also be an imbalance on the use of resources, in that there may be a lack of operating theater time, trained theater staff, anesthetists, or beds in some localities where surgeons are available. On the other hand, they also point to possible inefficiencies in the use of resources. For example, it can be seen from Figure 2 that there are wide variations in one English region in the number of operations per ophthalmology firm per year. The variations are only partly explained by the availability of more junior surgeons (senior registrars in Figure 2). Perhaps even more worrisome is the fact that the average number

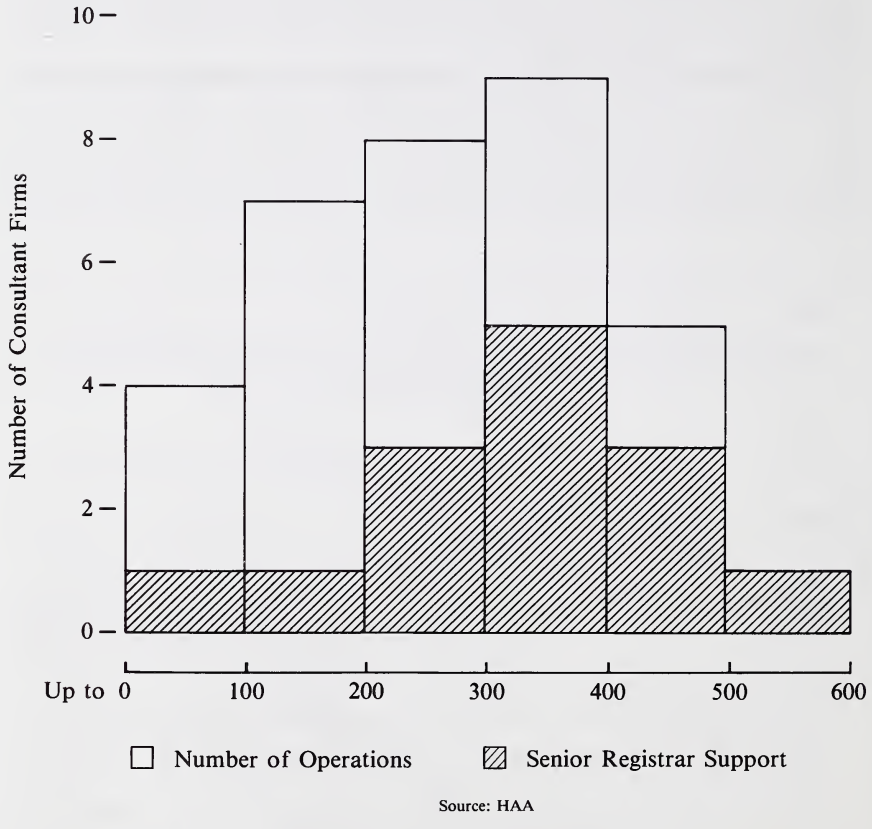


Figure 2. **All operations by consultant firm (cold, day-case, and emergency). 34 surgeons in one region 1985.**

of operations per firm (275) is below the guideline suggested by the College of Ophthalmologists (between 320 and 400 per year). The operating rates are also far below those of surgeons in other clinical specialties.

Drummond and Yates also point to variations in the number of day-case admissions (see Figure 3). This has been shown to be more cost-effective than inpatient care in a developed country setting.[6] Of course, such aggregate data do not prove that resources are being used ineffectively. However, they do suggest that further inquiries are justified.

Finally, Drummond and Yates consider various ways of clearing the backlog. One particularly interesting local initiative in the United Kingdom is "Operation Cataract" because it draws its inspiration from the eye camps that have been established in the developing world.[7] By using a local hotel rather than hospital beds, which were in short supply, about 100 patients were operated on in a five-day period. Using the hotel increased bed capacity in the ward from 115 nights to over 400 nights. Overall, the scheme represented an intermediate stage between day-case procedures and traditional inpatient treatment.

In summary, evidence from the United Kingdom suggests that not enough resources are devoted to cataract surgery when compared with other health-care interventions. Furthermore, the

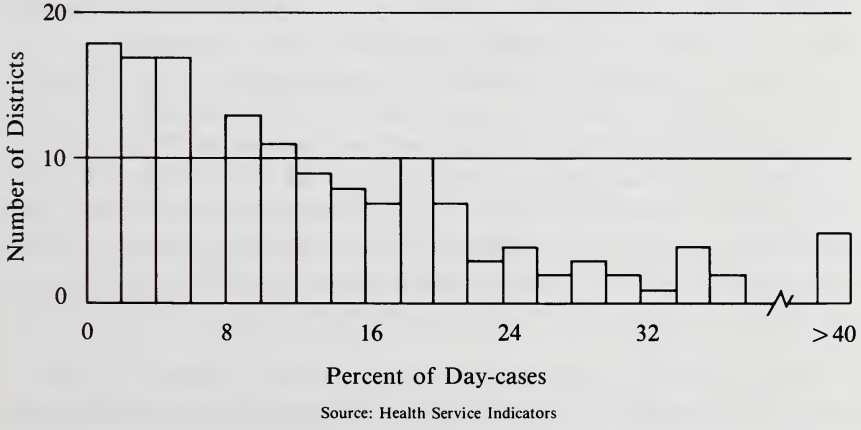


Figure 3. **Percent day admissions for ophthalmology 1987 (153 displayed).**

resources devoted may not be being used in the best possible way. Further analysis is required to assess whether day-case surgery and local initiatives like "Operation Cataract" represent a more cost-effective use of resources.

EVIDENCE FROM THE DEVELOPING WORLD

Most of the data presented in this section are taken from a report on a visit to Aravind Eye Hospital in southern India, sponsored by the National Eye Institute.[8] The purpose of the visit was to collect preliminary data on two aspects of the economics of cataract, including the following questions: What is the economic impact of blindness on patients and their families, and how does this affect willingness to attend for surgery? Is extracapsular extraction with an intraocular lens (ECCE-IOL) a feasible and cost-effective alternative to intracapsular extraction (ICCE) in the developing world?

The first issue therefore relates to need for cataract surgery and hence the resources that should be devoted to it. The second is one of the most important current issues relating to the use of resources devoted to cataract surgery.

Economic Impact of Cataract Blindness and its Relationship to Attendance for Surgery

This was investigated through interviews with patients attending the outpatient clinic (in the paying section of the hospital) and with people in two villages, Chittaloti and Karayanpatti, in the Kallupatti Block of Madurai District approximately 50 kilometers from the city. The patients in the paying section were virtually all accompanied by relatives who, in general, paid for the surgery. The persons interviewed in the villages were a mixture of past cataract patients and those being examined for the first time. Most of these had been identified by health workers from ASSEFA, a voluntary organization working in the area. Around 50 persons in all were interviewed.

Although the paying patient generally had more resources, a common feature for all was the dependence upon the family structure for their economic survival. In particular, the older patients were often living with or near their children, who provided them

with food or money. Many of the patients in the paying section had been severely visually impaired for a year or more. They had finally presented themselves for surgery when their relatives had saved enough money and could spare the time off work to bring them. Since surgery was normally performed the next day and involved an inpatient stay of five days, the financial sacrifice by the accompanying relative could be substantial. Although the relatives of paying patients were encouraged to stay in the hospital to reduce nursing costs, those of the free patients were *dis*couraged to reduce the total financial burden on the family. However, the hospital was not always successful in convincing people to come in for surgery alone because of strong family ties.

The charges for cataract extraction ranged from Rs. 550 ($33) to Rs. 1,000 ($60) depending on the quality of the hospital room (January 1990 prices). The *additional* charge for extracapsular extraction with a posterior chamber intraocular lens was Rs. 1,200 ($72).

Wage rates in the rural economy were Rs. 7–10 ($0.42–0.60) per day for men and Rs. 4–7 ($0.24–0.42) per day for women, with most people working around 200 days per year. As one would expect, wage rates in the city were generally higher, but with a wide range. A hospital cleaner would make about Rs. 10 per day ($14.50 per month), whereas one bank employee accompanying his mother to hospital was earning Rs. 3,000 ($180) per month. Old age pension, available only to those with no living relatives to support them, pays Rs. 50 ($3) per month. Therefore, for many people, not only is the cost of surgery a barrier, but transportation to the hospital (Rs.20 for a round trip from some villages) and loss of earnings can also be problematic. This finding is confirmed by the recent study on the social determinants of cataract surgery in southern India.[9]

The level of functioning of individuals varied with their level of disability and role in the community. Those identified in need of immediate surgery had vision less than 3/60 in the worst eye. Although most reached the village health post unaccompanied, few could count fingers. Other people seen had vision better than 3/60 but less than 6/18, although these people were having difficulty seeing properly they were not given priority for surgery.

There is little doubt that blindness from cataract imposed an economic and social burden on the affected individual and their families. The extent to which this imposed an economic burden on the community as a whole by reducing the potential work force was

harder to assess in this small survey. For example, if the economy were not operating at near full employment, the lack of work capacity from the cataract blind would not be very significant. However, it is known from larger surveys[10] that a significant proportion (55 percent) of Indians in the 50–59 age group have a cataract in either eye. Also, from the small ad hoc survey undertaken here, there were surprisingly high labor participation rates among women and those over 60. In addition, in rural subsistence economies, there are peak times of the year (e.g. harvests) where all available manpower is required. However, this aspect would require further study.

In summary, all the patients needing surgery were at near subsistence level and required someone else to support them. Unless they lived with or near their children, they would be unlikely to have enough resources to pay for surgery. In the villages the household income of cataract blind people living with their spouse could be less than $0.50 per day. For these individuals the cost of food and transportation for their hospitalization would be a major financial barrier. In addition, the spouse would be unable to give up work in order to accompany them to hospital. Unless the person could be persuaded to come alone this would be yet another barrier to surgery. Cataract blindness was therefore an economic burden on the family and probably also to society at large.

Cost-effectiveness of ICCE and ECCE-IOL

Now that extracapsular cataract extraction with a posterior chamber intraocular lens (ECCE-IOL) has established itself as the procedure of choice in the developed world, there are some who argue that the same approach should be encouraged in the developing world. Advocates argue that the superior vision afforded by ECCE-IOL, while beneficial in its own right, might also encourage more patients to come for surgery. In addition, they argue that in some settings patients are now demanding ECCE-IOL.

On the other hand, concerns have been raised about the higher costs of ECCE-IOL as compared with ICCE, the increased need for capsulotomies, and possible other complications.[11] Aravind provided a good setting to explore these issues further because it undertakes both ECCE-IOL and ICCE with good results and is generally well-organized. It also operates in a region where there is a significant cataract backlog and where choices in the allocation of scarce

resources are particularly stark. From the economic viewpoint, the choice between the two procedures depends on comparative costs and quality of outcome.

It was stated above that the current charge at Aravind for a basic ICCE with the lowest quality hospital room is $33. Because some of the funds from the paying patients help to subsidize the care of the free patients, the true cost of the operation is probably less than $30. The basic aphakic spectacles, which are given free to those who cannot pay, cost Rs. 50 ($3), although more sophisticated spectacles can cost as much as Rs. 1,000 ($60). Therefore, a fair cost estimate for the whole procedure is $30, including the provision of one pair of basic spectacles.

The incremental charge for ECCE-IOL at Aravind was Rs. 1,200 ($72), although again this may not necessarily reflect true cost. There were a number of additional costs: increased surgical time, extra tests and consumables, and more sophisticated equipment. These are discussed in turn.

The time taken for cataract extraction varied greatly between surgeons. Most of the surgeons at Aravind were highly skilled in the procedure and would expect to perform an ICCE in six to seven minutes. It was estimated that implanting an IOL takes about an extra five minutes. No significant additional training would be necessary at Aravind because 50 percent of the surgeons can already perform ECCE-IOL.

In Aravind the extra time taken for ECCE-IOL, although small, would seriously reduce surgical throughput, because this is already extremely high in relation to the level of resources. Around 100 extractions are performed each day using 4 operating theaters and the average surgeon performs 1,400 operations per year. However, the average for India is only 130 operations per ophthalmologist, although all do not operate. Therefore, it is possible that in other less-efficient centers the increased time to perform ECCE-IOL could be absorbed with no loss in overall surgical throughput. In Aravind, throughput could not be maintained without extra resources.

A number of extra tests and consumables are required for ECCE-IOL. Concentrating on consumables, the main items are the lens itself and the visco-elastic agent. At the time of the study, Aravind was able to buy modern posterior chamber lenses for Rs. 300 ($18), although the general market price in India is currently Rs. 600 ($36). The visco-elastic agent costs $120 per packet, although the use of

this was kept to a minimum (around 5 percent of patients) by injecting air during the operation.

The expected incremental cost for consumables was therefore $24 based on the assumption that a plentiful supply of cheap lenses could be maintained. (Like many other hospitals in the developing world, Aravind has a number of lenses donated. However, this has been ignored because such donations would not cope with a major switch to ECCE-IOL and, in any case, there is still a real resource cost for donated lenses. That is, the donations could be used for something else.)

The main additional items of equipment were the operating microscope and the YAG laser for performing capsulotomies. (Although capsulotomies can be performed surgically it has been assumed that this would not be feasible without seriously affecting the capability to reduce the cataract backlog.)

Aravind is equipped with operating microscopes in all four theaters. These cost Rs. 40,000 ($2,400), and are manufactured locally. On the assumption that these last at least five years, the incremental cost per operation is insignificant given Aravind's throughput.

YAG lasers are not currently manufactured locally and cost Rs. 660,000 ($40,000). Aravind had two machines, one bought for $30,000 and the other (a demonstration model) bought for $8,000. In addition, the annual maintenance contract was Rs. 25,000 ($1,500) per machine. Assuming a 10-year life and a discount rate of 10 percent per year, the equivalent annual cost per laser, including maintenance, was approximately Rs. 100,000 ($6,000). The additional cost per patient depends critically on the number of capsulotomies that are required and the number of lasers needed to perform them.

At the time of the study, Aravind was performing around 40,000 operations per year. Conservatively, one would expect 25–30 percent of patients having ECCE-IOL to require a capsulotomy within five years. Therefore, if Aravind were to switch completely to ECCE-IOL it would eventually need to perform about five capsulotomies a year for every 100 patients having an extraction (or 2,000 per year). This level is within the capability of the existing lasers, being about 20 per week per machine. On a per patient basis this would imply an incremental cost of $3.00 per extraction to allow for capsulotomy. (This ignores the additional costs falling on the patients, which may be $0.50-$1.00 for transportation.)

In total the additional cost of ECCE-IOL is likely to be $27, comprising $24 for consumables and $3 for equipment. In other words ECCE-IOL is approximately double the cost of ICCE. In addition, real resource restrictions at Aravind would mean that the number of extractions in a year would fall because of the extra surgical time needed for ECCE-IOL. However, the main target in reducing cost would be consumables, the major component of which is the lens itself.

Nobody denies that superior vision is obtained with ECCE-IOL in the developed world. However, less is known about outcomes in a developing country setting and the impact that improved vision has on the quality of life and functioning of the patient. The rates of complications for ICCE and ECCE-IOL in the developing world could only be accurately established through a clinical trial. However, the informal impression was that outcomes were good and complication rates low for both procedures at Aravind. Javitt et al.[12] found that 85 percent of the patients they surveyed achieved postoperative visual acuity of 6/36 or better.

The other aspect of quality of outcome is the satisfaction expressed by the patient. Ideally, a rigorous survey is required, although preliminary data already exist in Aravind. First, approximately 45 percent of the paying patients (or their relatives) in Aravind opt for ECCE-IOL when the choices (and costs) are explained to them. The percentage was even higher (70 percent) in the sister hospital. Although records were not analyzed, hospital staff felt that those opting for the more expensive procedure were those whose jobs required good vision, truck drivers, for example. This view was supported by the report that a major company employing drivers had requested ECCE-IOL on their behalf.

On the other hand, during the village visits a high proportion of operated patients (over 90 percent) were still wearing their aphakic spectacles. It was suggested, however, that this was partly due to the active involvement of ASSEFA in the villages concerned. Most patients could see reasonably well with their spectacles, although a minority (less than 10 percent) did complain of vision problems, and probably needed new spectacles. No data were collected on whether some patients had been issued with more than one pair. However, at $3 per pair a considerable number of re-issues would be required to reduce the difference in cost between ICCE and ECCE-IOL.

In summary, the study in Aravind suggested that cataract blind-

ness was a source of economic burden to patients and their families. Although overall the program of cataract extraction was operating efficiently, a number of issues remained unresolved, most notably whether to increase the number of extracapsular cataract extractions with intraocular lens implant.

CONCLUSIONS: SUGGESTIONS FOR FURTHER RESEARCH

A number of research initiatives for improving the efficiency and effectiveness of cataract care in developing countries have been previously identified.[13] These were projects to:

1. Prepare the effectiveness of various methods of identifying cataract-blind people within a community and, through the reduction of psychosocial and economic barriers, motivate them to seek surgery;[14]
2. Compare alternatives for improving access to cataract surgery, such as eye camps or the establishment of temporary satellite hospitals;
3. Evaluate alternative forms of minimum level ophthalmic surgical facilities in regions that are currently underserved;
4. Improve operating room efficiency;
5. Determine ways of reducing the postoperative stay following cataract surgery;
6. Increase the number of ophthalmic personnel trained to perform cataract surgery in underserved areas.

A number of other potential research questions could be added based on the discussion above, including the following:

1. How does cataract surgery improve the economic well-being and quality of life of patients? (This relates both to the developed and developing world.)
2. Does the implantation of intraocular lenses increase the uptake for cataract surgery in developing countries because of the superior sight obtained?
3. What are the nature and relative rates of complications for ECCE-IOL and ICCE in developing countries?
4. What is the likely cost of intraocular lenses produced in the developing world?

Once these questions have been answered, it will be possible to assess the appropriateness of the level of resources devoted to cataract surgery in developing countries and the most cost-effective form of treatment.

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3

Update: Xerophthalmia, Keratomalacia, and Child Mortality including Measles

Dr. Barbara A. Underwood

An effort was made recently to reevaluate the global magnitude of the problem of childhood blindness.[1] The consensus of those gathered in London was that there are an estimated 1.5 (± 0.5) million blind children (less than 3/60) under 16 years of age in today's world and another 500,000 are visually handicapped to the extent of requiring rehabilitation services (between 3–6/60). Of the 500,000 blind, 70 percent (350,000) are probably due to vitamin A deficiency. About twice as many (700,000) annually are thought to have active corneal involvement, and about tenfold more (6–7 million) are believed to have milder forms of clinical deficiency, i.e., xerophthalmia.

Subclinical, or marginal vitamin A depletion to the extent of having adverse physiological consequences affects an unknown multiple of this number. Some recent studies suggest that in some populations where dietary intake is documented to be chronically inadequate, 50–60 percent of the preschool-age children may be vulnerable to the morbidity and mortality risks of an inadequate vitamin A status. It is obvious that vitamin A deficiency, both as an evident clinical problem and as a more difficult to detect subclinical problem, continues to be of public health significance. Based on the WHO assessment as of 1985, the more serious problem is located primarily in Asia and Africa.

Dr. Sommer and his colleagues in Indonesia focused attention on the health and survival consequences of vitamin A deficiency not only for children with xerophthalmia, but also those without clinical signs who reside in areas where the problem is endemic. They reported that child mortality could be reduced from 34 to an estimated 75 percent and their studies implied that morbidity, especially from diarrhea and respiratory infections, was reduced as well. These claims astounded much of the scientific community who

called for repetition of the studies using a masked, placebo-controlled design that was not possible in Indonesia due to governmental policy.

A very recent randomized, masked, controlled study was reported from Tamil Nadu in southern India.[2] This study was not a repeat of the Indonesia work that used a six-monthly distribution of the high-dose vitamin A capsule. Instead, the Indian study provided vitamin A in a dosage equivalent to the recommended intake for preschool-age children, the level easily obtainable from food. It was implemented by trained, local community workers who delivered the vitamin directly into the mouth of children each week for one year. Remember that this was an amount of vitamin A easily available through common local foods if it were incorporated into the family pot from which the children eat. The results confirmed the importance of an adequate vitamin A status for child survival in child populations where chronic malnutrition and vitamin A deficiency are highly prevalent.

Providing a consistent supply of vitamin A at a level attainable through food reduced mortality risk by more than half and the effect of the improvement in vitamin A nutriture was almost immediately evident. However, this study did not find an effect of the vitamin on reducing the risk of common morbidities, i.e., diarrhea and respiratory infections. These results emphasize that vitamin A supplements alone will not solve the health problems of children from these very deprived environments. Other public health and sanitation programs are equally important, and must be accompanied by effective nutrition and health education that focus on improved environmental sanitation, personal hygiene, female literacy, and appropriate child feeding.[3]

Indeed, the study from Madurai emphasizes the importance of taking a long-term approach to solving the vitamin A deficiency problem in deprived societies and in utilizing community-based infrastructures for implementation. The first need is to raise the awareness of professionals, such as those in this audience, national and local leaders, and community residents of the importance of the problem to child health and survival. Then to introduce throughout the local infrastructure appropriate nutrition and health education, emphasizing the use of available, culturally acceptable vitamin A-containing foods prepared suitable for young child diets.

Past failures in approaches to nutrition education have been marked by use of methods and materials unrelated to the reality

of the situation confronted by those being "educated." New approaches are required that are based on understanding the local situation and the potential for building upon knowledge derived from the community to adapt behaviors in child feeding to those relevant to solving the problem of vitamin A deficiency. Although high-dose supplementation programs have their place in treatment schedules and in those rare circumstances where there is no recourse through food, emphasis needs to be placed on food as the solution because in so doing, one addresses in a sustainable manner the other common nutritional inadequacies as well.

Measles is a devastating disease contributing to malnutrition and mortality in young children throughout the world, and in Africa it is a significant cause of blindness as well. This association between measles and blindness in Africa is well recognized. As the WHO Expanded Program on Immunization (EPI) continues to increase coverage with measles vaccination, a substantial reduction in the measles-related deaths and blindness can be anticipated. Until this occurs, it is important particularly in Africa to have a clear understanding of the synergistic relationship to ocular health and survival between measles and vitamin A deficiency.

Studies have made it clear that vitamin A therapy does not prevent measles keratitis, but there are studies that suggest it prevents these lesions from progressing to blindness. However, there have not been randomized, placebo-controlled prospective clinical field trials to quantify the role of vitamin A deficiency in measles-related blindness and mortality. As a consequence, the use of vitamin A in treatment programs was not stressed until recent years. Drs. Barclay, Foster, and Sommer[4] refocused our attention on this association through their hospital-based study in Tanzania that was reported in 1987. This study showed a protective effect against mortality, particularly among children under two years of age, of giving two doses of 200,000 IU vitamin A one day apart. This led the WHO/EPI program later the same year to recommend routine use of vitamin A supplements for all children with measles in regions where vitamin A deficiency is a recognized problem and suggested that elsewhere "in countries where the fatality rate of measles is 1.0 percent or higher that it would be sensible to provide vitamin A supplements to all children diagnosed with measles."[5]

The effectiveness of vitamin A is best documented by hospital-based studies. Observational studies in Kinshasa, Zaire,[6] associated lower vitamin A levels with measles deaths during hospitalization

and a very recently reported randomized, controlled trial in South Africa reported that the risk of death was reduced by half by giving two doses on consecutive days of 200,000 IU vitamin A.[7] Accompanying pneumonia, diarrhea, and croup symptoms were relieved faster as well. The authors recommended that *all* children with severe measles be given high doses of vitamin A because previous nutritional adequacy may not ensure against development of hyporetinemia in severe measles.

This recommendation seems highly appropriate for Africa. Measles in Asia, however, where equally high levels of hyporetinemia are reported and where clinical vitamin A deficiency is more prevalent than in South Africa, is less severe in its irreversible ocular consequences.[8,9] It still is associated with mortality and blindness,[10] but the protective role of vitamin A needs additional clarification.[11] Other risk factors such as the extent and kind of accompanying PEM may be an important explanation of the regional differences noted.

In any case, any infection increased the need for vitamin A, and measles infections seems to exaggerate this demand even more. Thus, in areas where vitamin A deficiency is endemic, vitamin A supplementation along with measles treatment seems warranted. Again, however, equally important are programs that both prevent measles through vaccination and vitamin A deficiency through proper diet prior to the time children are at high risk of contracting measles. Of course, measles immunization programs alone will go far toward alleviating the problem of related blindness and mortality. These programs in areas where vitamin A deficiency is endemic potentially can also deliver the vitamin and the message that could relieve also the vitamin A-related mortality.

The current generally held view on the relation of vitamin A deficiency and child health and survival recently was summarized in a statement by the Steering Committee of the International Vitamin A Consultative Group (IVACG). (A copy of the full statement is available for those interested. Write to the IVACG Secretariat, International Life Sciences Institute—Nutrition Foundation, 1126 Sixteenth St., N.W., Washington D.C. 20036 USA.) It is obvious that there is an urgent need to identify child populations where clinical vitamin A deficiency exists, but also those where marginal deficiency may be contributing to high child-mortality rates, and perhaps morbidity. Newer methods for the assessment

of subclinical deficiency are being developed, and are the topic of the next speaker.

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4

Assessment Methodologies for Xerophthalmia, Keratomalacia, and Child Mortality including Measles

Dr. Emorn Udomkesmalee

Signs of xerophthalmia or eye lesions leading to permanent blindness display vitamin A deficiency at a late phase. It is important, therefore, to detect the population at risk as early as possible prior to the development of clinical eye signs. Serum concentrations of vitamin A or retinol are commonly used to assess the status. A level less than 10 μg/dl (0.35–0.70 μmol/L) is low; more than 20 μg/dl is adequate.

Serum vitamin A, which is primarily found in the liver, is a poor reflector of the vitamin A that the body stores. A technique to estimate the liver store of vitamin A, called the relative dose response or RDR, has been developed recently. This test is based on the theory that under the condition of high vitamin A stores, serum level is little affected by oral doses of vitamin A, whereas a marked increase in serum concentration five hours after the oral dose is observed with a depleted store. This test calls for obtaining a fasting blood sample for vitamin A determination (Ao), administering orally a standard dose of vitamin A (600 retinol equivalents), and finally providing a low vitamin A breakfast to be followed five hours later with a second blood sample drawn to analyze vitamin A (A5). The percentage RDR value is calculated by A5-AoxlOO/a5. An RDR of more than 20 percent indicates depleted vitamin A stores.

By using RDR we were able to distinguish a group of Thai preschool-age children with inadequate liver stores. Their serum concentrations fell between 20–30 μg/dl, otherwise considered adequate. In addition, we observed that children with serum vitamin A above 30 μg/dl appear to have sufficient liver stores as estimated by RDR.

Another recent technique is conjunctival impression cytology (CIC). This is based upon the observation that early vitamin A

deficiency results in enlarged, keratinized epithelium with loss of goblet cells or the mucus-secreting cells. Imprint specimens were obtained from the temporal bulbar conjunctiva, then fixed and stained by a standard cytology procedure.

Normal CIC specimens show abundant goblet cells on a sheet of small epithelial cells. As the status declines, fewer goblet cells and more enlarged epithelial cells are seen. Abnormal CIC showed a complete loss of goblet cells. A current double-masked intervention study in northeast Thailand indicates that schoolchildren receiving a low dose of vitamin A on a daily basis for six months showed a marked improvement by restoration of normal conjunctival epithelium. Conversely, those without vitamin A supplements maintained the abnormal CIC stage. Continued testing of this technique is needed to help determine its usefulness for screening populations.

Because the early stage of vitamin A deficiency results in impaired vision in dim light, a rapid dark adaptometry by instrument has been developed by a group of research scientists and ophthalmologists affiliated with the Institute of Nutrition at Mahidol University, Thailand. The instrument consists of a controlled switchboard panel with a small amplifier and timers. A child is seated with one eye looking through a channel. A specially modified goggle and a black cloth cover the eyes and face to prevent the entry of outside light. The bright light is turned on for two minutes followed by a dim light as a slide containing a single Thai letter appears on the screen. The elapsed time from when the second dim light is turned on to the time when a correct letter identification is made is termed vision restoration time (VRT). The investigators found that VRT corresponded to serum vitamin A in a dose-gradient fashion. The lower the serum levels, the longer it took to restore vision in dim light. Children with abnormal CIC showed longer VRT.

VRT manifested the same pattern of seasonal variation on a larger population basis as seen with serum vitamin A concentrations. Moreover, schoolchildren supplemented with a school lunch program of vitamin A food sources for one year showed improvement. Children with the longest VRT improved the most. No improvement of VRT was observed in the control schools. We suggest the use of conjunctival impression cytology and rapid dark adaptometry in screening for high-risk populations as well as for use as a follow-up for community-based vitamin A intervention programs. More work is needed with rapid dark adaptometry. Through

consultation with experts at the National Eye Institute in Bethesda, Maryland, efforts are underway to improve instrument sensitivity and applicability to the younger-age children.

We deeply appreciate the contribution of the vitamin A assessment team from the Institute of Nutrition at Mahidol University.

5

Update: Onchocerciasis

Dr. Adenike Abiose

It is estimated that 86 million persons are at risk of onchocerciasis, 17.8 million are infected, 336,400 are blind, and a similar number suffer severe visual impairment, most of them in Africa. The socioeconomic impact of the disease on individuals and communities is devastating, and forms the basis for justifying the massive international expenditure on its control.

The operations of the Onchocerciasis Control Program in West Africa started in 1975 and were based solely on the control of the vector Simulium damnosum until 1987, when Ivermectin, an effective and safe microfilaricide, was registered. This drug has increased the prospects for large-scale community therapy of the disease, and provided an alternative control method that is being investigated in Nigeria and other countries of West Africa. A summary of the Nigerian experience is presented.

INTRODUCTION

The control activities of the Onchocerciasis Control Program in West Africa (OCP) started in 1975 and initially involved seven countries. Activities have been extended into four other countries, bringing the area now covered to 1.3 million square kilometers. At the inception of the OCP, there was no drug suitable for mass distribution in severely affected communities. Consequently, the approach was to interrupt Onchocerca volvulus transmission through control of its vector, Simulium damnosum. This method has proved successful, with virtual interruption of transmission accomplished over some 600,000 square kilometers in the original area as demonstrated by entomological and epidemiological methods.[1] The overall complexity and cost of executing the program, however, makes it unlikely that it can be replicated in other affected African countries.

The registration of Ivermectin provided a safe alternative for

the control of the disease that is currently being tried in other West African countries, including Cameroon, Liberia, Nigeria, and Sierra Leone. Experience from various studies has uniformly demonstrated the efficiency and safety of the drug. Adverse effects have been few and essentially minor[2,3,4,5] and are milder and less frequent with subsequent doses. Most of the reactions experienced are the result of microfilarial death, and consist of itching, rash, headache, arthralgia, and myalgia. Others include pain, tenderness, swelling, tachycardia, and hypotension. However, few severe reactions have been recorded. The most significant effect is severe symptomatic postural hypotension (SSPH). Severe asthma is also a rare reaction. Ivermectin is a microfilaricide without macrofilaricide effect. This makes it effective when given on an annual basis.

BACKGROUND INFORMATION ON NIGERIA

The Federal Republic of Nigeria is a country situated in West Africa whose western border forms the eastern border of the OCP. The surface area of the country is approximately 924,000 square kilometers. The population is estimated to be about 120 million. Like most developing countries, the population pyramid is broad at the base: most of the population is very young and life expectancy is only 50 years. A study of geography and ecology shows rain forests in the south, sudan savanna in the middle-belt, and sahel savanna to the extreme north. For administrative purposes the country is divided into 21 states and the Federal Capital Territory.

The national health policy that came into effect in 1988 is based on the primary health-care system. The federal government provides tertiary health care, the state governments provide secondary health care, and the local governments, of which there are 450, provide primary health care.

ONCHOCERCIASIS-CONTROL ACTIVITIES IN NIGERIA

Onchocerciasis was first reported in Nigeria in 1908 and has been recognized as a major cause of blindness in northern Nigeria since the pioneer work of Rodger and Budden.[6,7] The latter found blindness prevalence rates as high as 5.6 percent in the hyperendemic Hawal Valley area of the present-day Gongola State. With the success of the OCP operations, it is estimated that Nigeria is presently

the most onchocerciasis-endemic country in the world, containing more than 60.0 percent of West Africa's cases. According to World Health Organization estimates, 40 million Nigerians are at risk to the disease, approximately 1 million are infected, and about 120,000 are blind from it.[8] It is hoped that up-to-date information will become available after collection of the recently concluded nationwide epidemiological survey commissioned by the National Onchocerciasis Control Program (NOCP).

There have been isolated attempts at vector control by larvicide in different parts of Nigeria since the 1950s, including the Oji River, the Mimi River, the Abuja area, the Hawal River, and later the Kainji dam area, initially using DDT and later changing to temephos.[9,10,11,12] The main problem encountered has been reinvasion, which unfortunately has led to the abandonment of most of the projects.

The success of the OCP renewed interest in onchocerciasis control in Nigeria and led to the creation of the National Onchocerciasis Control Program in 1981. At inception, the plan was to employ vector control similar to that being done in the OCP area. Soon it became obvious that the country did not have the financial or technical expertise to execute such an expensive and complicated program. Activities of the NOCP were therefore limited to planning, data collection, policy decisions, fund attraction, and training of personnel. With the advent of Ivermectin, the decision was made to distribute the drug to severely affected communities. The Mectizan Expert Committee has approved the release of the first consignment of Ivermectin to Nigeria before the end of 1990.

COMMUNITY CONTROL OF ONCHOCERCIASIS WITH IVERMECTIN IN NIGERIA

There are several ongoing projects in Nigeria that have contributed to the knowledge of onchocerciasis and should be immensely valuable in planning future control activities in Nigeria.

The level of community acceptance and incidence of serious adverse effects of using Ivermectin for onchocerciasis are being studied in a placebo-controlled trial based in Kaduna State. In a population of 12,702 recorded at census, 10,492 (82.6 percent) were age five years or more. Of the total, 8,140 people were eligible for dosing, and 6,270 (77.0 percent) were dosed with either Ivermectin

or placebo. Of the 3,139 dosed with Ivermectin, 15.9 percent experienced minor adverse events: itching (9.5 percent), headache (4.2 percent), dizziness, edema, arthralgia, or fever (1.4 percent). Coverage increased marginally at second dosing and adverse events were fewer and milder. Pregnancy and lactation accounted for 67.0 percent of all exclusions. (There is a great need to pay particular attention to the female population in any mass control campaign in Nigeria.)

Of the 6,833 persons examined, 609 (8.9 percent) persons were found to have ophthalmic signs consistent with optic nerve disease. These and an enriched random sample had a detailed eye examination including fluorescein angiography. No serious adverse ocular events were recorded. There was no worsening of visual function and optic neuritis, known to occur with diethylcarbamazine. The question of whether annual dosage with Ivermectin would prevent visual deterioration remains to be assessed at the two-year follow-up visit.[13]

The study of the vectors and dynamics of transmission of onchocerciasis in relation to optic nerve disease in northern Nigeria has just been concluded. Findings show a classic hyperendemic focus in the West African savanna area. Cytotaxonomic determinations showed S. damnosum s.s. to be the dominant vector at Kudaru.[14]

The drug trial offered the opportunity to study the mechanisms of resistance and the immunopathology of onchocercal lesions through the study of people with and without patent disease and with and without various onchocercal lesions. The modulations of these responses by treatment with Ivermectin is also being investigated.[15]

Another project based in Enugu Anamhra State in southeastern Nigeria is studying the epidemiology of onchocerciasis in a forest mosaic area. The study area is Achi and the affected communities are at varying distances from the Oji River. Community distribution of Ivermectin has commenced.

An offshoot of these studies has been the collection of baseline data that provides accurate population-based blindness prevalence figures, not only in onchocerciasis-endemic areas, but also in the non-endemic to hypo-endemic control areas. Whereas the blindness prevalence rate was found to be 3.2 percent in the high mesoendemic area, it was only 0.6 percent in the hypoendemic area. The control of onchocerciasis in these endemic areas is a most important intervention method for the control of blindness.

Rapid assessment methods for the level of community infection,

which are of operational importance for mass distribution of Ivermectin, have also been investigated.

Rapid estimation of onchocercal endemicity using "leopard skin" has been investigated by Edungbola and others,[16] whereas the community blind eye test has been investigated by Jones and others.[17] Other teams are also trying to develop safe, reliable, and sustainable means to mass distribute Ivermectin to the remote rural communities where it is needed.[18]

The National Plan for Ivermectin Delivery and its Interrelationship with the National Program for the Prevention of Blindness:

Mass distribution of Ivermectin to needy communities is expected to start before the end of 1990 in one local government area of each of the four health zones. The plan is to retrain primary health-care workers where they reside to carry out the distribution. In other communities, individuals who have been selected by the community will be given a short training program enabling them to function as community-based distributors acting as voluntary village health workers.

Spot prevalence surveys will be carried out to determine communities that qualify for mass chemotherapy. Only communities with at least a 40 percent prevalence rate by skin snip of microfilarial positivity will receive community chemotherapy. In communities with lower endemicity, only individuals with clinical disease will be treated. The teams distributing Ivermectin will be retrained to collect accurate information on blindness and blinding diseases in all communities in which they are working. This is possible because the same directorate in the Federal Ministry of Health is coordinating both programs. When additional funds become available, activities will be extended to other local governmental areas.

CONCLUSION

Onchocerciasis is still a major blinding disease in many parts of West Africa. The majority of those still affected are in Nigeria. Onchocerciasis control is presently receiving urgent international and government attention. Although vector control is the ideal way to interrupt transmission of the disease, this has been found to be too expensive and too complex to be employed in Nigeria. Ivermectin distribution to communities has been chosen as a way of reducing

the human disease burden, although it is understood that this may have to be combined with focal vector control in areas with severe disease. With careful planning, it should be possible to control Onchocerciasis in Nigeria.

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6

Use of Ivermectin in Onchocerciasis Control

Drs. K.Y. Dadzie, G. De Sole, and J. Remme

Ivermectin, a macrocyclic lactone, has been shown in clinical and community-based trials to be an effective microfilaricide, easy to deliver, and safe for mass treatment of human onchocerciasis. The Onchocerciasis Control Program (OCP) in West Africa has treated over 250,000 persons in high-risk areas since the registration of Ivermectin in 1987. Some of the areas that are under treatment underwent ophthalmological examinations before distribution of Ivermectin.

In this presentation, ocular changes which have occurred over a two-year period in populations that have undergone annual treatment with Ivermectin since October 1987 will be described. The populations described live in the three most hyperendemic villages in the savanna of Asubende in northern Ghana and have undergone annual treatment with Ivermectin since October 1987. The criteria for subjecting communities to Ivermectin treatment in the OCP area will be explained.

The study population that underwent ophthalmological examinations consisted of 568 persons at least five years of age who were drawn from the census of 864 people living in the three holo-endemic villages with a Community Microfilarial Load (CMFL) ranging from 58 to 73 mf/s. The prevalence of infection as measured by skin snip ranged from 85.6 percent to 87.3 percent. The prevalence of blindness as measured by visual acuity was found to range from 1.2 percent to 4.4 percent and increased from 1.8 percent to 13.0 percent when the results of visual field test were considered. In this study 334 persons were treated twice, 89 once, and 14 were not treated because of the exclusion criteria. All had full ophthalmological examinations throughout the study period.

Two months after treatment, Ivermectin had reduced the skin microfilarial loads in the population treated twice by 96 percent

of their original pretreatment value. Twelve months after dosing, however, the microfilarial loads had increased to 40 percent of the pretreatment value. Following the second dosing after one year, similar changes in the skin microfilarial loads were registered at examinations 14 and 24 months after the start of the study.

The mean ocular microfilarial loads, as illustrated by the microfilarial count in the anterior chamber of the eye and in the cornea, also fell to very low levels four months after treatment but rose again 12 months after treatment. A similar pattern of fluctuating ocular microfilarial loads was repeated after the second annual dosing 16 and 24 months after the start of the study. Most of the people who still had microfilarial loads after 24 months had only very low loads, even though a considerable number of the population under study had very high ocular microfilarial loads of 32 and more before the study started. This implies that the risk of developing eye lesions in the populations has been reduced considerably or is being eliminated.

Two rounds of Ivermectin treatment significantly reduced the occurrence of the early stage of iridocyclitis (defined as any acute or torpid iridocyclitis without synechiae) to insignificant levels. The prevalence of advanced iridocyclitis showed only a mild downward trend. A regression that was less pronounced was recorded for sclerosing keratitis. Analysis of lesions taken from the posterior segment of the eye showed that these lesions have remained stable over the two year period. These results suggest that Ivermectin is suitable for controlling onchocercal eye morbidity in the short term and could prevent blindness due to onchocerciasis if the drug were given annually.

The study also developed a model prediction showing that annual distribution of Ivermectin over a sustained period of time can control onchocercal blindness. However, the prevalence of onchocercal blindness can attain the original levels over time if the treatment is stopped, even if it is stopped after 25 years of annual Ivermectin treatment. This implies that Ivermectin distribution for prevention of blindness must be sustained over a very long period of time; this calls for a cost-effective strategy for distribution.

In the West African savanna blinding onchocerciasis has become a community problem with increasing intensity of infection in the community. Over 80 percent of the onchocercal blind are found in communities with CMFL of 10 mf/s or more, or where the prevalence of infection is 55 percent or more where only about 15

percent of the population at risk of onchocerciasis infection live. In communities with CMFL of 4 mf/s or more, or prevalence of infection of 40 percent or more, 97 percent of the onchocercal blind are found among about 30 percent of the population at risk of infection living in the endemic area. This clearly demonstrates that to ensure cost-effectiveness and maintain a sustained delivery effort Ivermectin distribution should be directed to the communities with CMFL of 4 to 10 mf/s or prevalence of infection of 40–55 percent. Before any Ivermectin distribution starts there must be an epidemiologic mapping of the area to identify the communities most in need of treatment to ensure meeting the objective of the exercise.

7

Organization of a Trachoma-Control Program in Africa, with Special Emphasis on Kenya

Prof. Henry S. Adala

INTRODUCTION

Trachoma remains a major cause of blindness in the world. More than 500 million people are affected and between 6 and 9 million people are blind from trachoma. In addition, many more are only partially sighted as a result of the infection. Trachoma is to a large extent a self-limiting disease and is dependent upon the community in which it is endemic.

Blinding trachoma is associated with seasonal bacterial infection. Its severity also depends on the rate of re-infection of an individual by Chlamydia trachomatis through eye-seeking flies. The disappearance of the disease is closely associated with economic development as well as social and behavioral changes. In several parts of the developing world, trachoma is a problem among rural communities where ignorance and poverty are commonplace.

BLINDNESS IN AFRICA

In Africa, trachoma is indeed a major public health problem. Blindness in most African countries ranges from between 0.5 percent and 1.0 percent. In hyperendemic trachoma areas, however, this rate increases to 2.0 percent in East Africa and 4.0 percent in North Africa. A review of the prevalence of blindness in Africa between 1968–81, using binocular vision of 3/60 or less as the definition of blindness, found the following in hyperendemic trachoma areas:

Country	Year	Blindness Prevalance from Trachoma
North Africa:		
Egypt	1974	4.7%
Morocco	1968	4.1%
Sudan	1976	4.5%
East Africa:		
Zambia (west)	1978	2.3%
Tanzania (central)	1979	2.3%
Kenya (Meru)	1981	1.9%
Malawi	—	1.3%
Zimbabwe	—	1.0%

According to information obtained from the proceedings of the sub-regional prevention of blindness seminar for East and Central Africa in Moshi, Tanzania, in 1984, trachoma is a leading cause of blindness in the following countries: Kenya (16 percent), Malawi (15 percent), Somalia (30 percent), Tanzania (25 percent plus other corneal scars), and Zimbabwe (30 percent plus other corneal scars). In addition, trachoma is a major cause of blindness in Ethiopia, Uganda, and Sudan.

CONTROL PROGRAMS

Control programs for trachoma have existed for the last 40 years. Identification and knowledge of the relevant epidemiologic determinants is necessary for the various communities to differentiate between blinding trachoma and non-blinding trachoma, for example:

Concomitant bacterial infection;
Degree of re-infection by chlamydia trachomatis;
Transmission agents (flies, clothing, and personal contact);
Poor water supply and poor personal hygiene;
Open faecal and rubbish disposal; and
Overcrowding

TRACHOMA IN KENYA

In Kenya, trachoma is second only to cataract as a cause of blindness.

Causes of Blindness in Kenya

Cause	Percent
Senile Cataract	38%
Trachoma	19%
Glaucoma	9%
Macular Degeneration	7%
Refractive Errors	6%
Others	22%

Trachoma in Kenya is a localized problem and the prevalence of both current inflammation (active trachoma) and inactive trachoma varies widely. In addition, various factors are interdependent. For example, an insufficient source of water is closely related to poor personal hygiene. People living in the arid areas of rural Kenya, for instance the Masai of the Kajiadc and Narok Districts and the Pokot and Njemps of the Baringo District, tend to have a higher prevalence of trachoma. Because these tribes are herdsmen and depend upon livestock for economic livelihood, they live in close proximity to their animals and are exposed to the persistent eye-seeking flies that have been implicated in the spread of the disease.

The organization of the trachoma-control program in these areas is incorporated in the National Prevention of Blindness Program, which attempts to treat all preventable and curable eye diseases. Shrinking resources and population increases make this the desired approach. Trachoma must be challenged at two levels, the primary level and the secondary level.

Primary Level

The target population is regularly visited by Clinical Ophthalmic Officers (COO) using mobile eye units. The Officer identifies the disease and records the stage (active or inactive, with trichiasis or corneal opacity). The COO distributes tetracycline to the patients to be used twice daily until the second or third month when they are revisited and the treatment continues. Others are instructed how to apply the ointment. During the visit, the Clinical Officer gives a brief talk on the importance of face washing, the necessity to keep animals away from dwelling houses, and the dangers inherent in

the traditional habit of animal fat anointing. In the Narok District, the MEU covers approximately 1,500 kilometers per month and rural health facilities are visited at least four times per year. They are now visiting Manyattas more efficiently.

In Kenya, we established the Primary Eye-Care Unit in 1986. It was headed by an ophthalmologist trained at the International Centre for Eye Health (ICEH) in London and run by two Clinical Officers also trained at ICEH. The task of this unit is to create and sustain awareness about the curable and preventable causes of blindness, including trachoma. They hold seminars and workshops during which basic eye hygiene is stressed and possible ways of eliminating environmental health hazards that might lead to blindness are explored.

The Unit also tries to warn against overcrowding. However, expecting change is unrealistic because overcrowding is linked to the socioeconomic status of a family and the cultural background of the region. The primary level therefore demands community participation.

Secondary Level

The same clinical officers identify entropion with trichiasis and refer patients to their district hospital where entropion correction is performed. In some cases, this can be done during mobile eye clinics by the Chief Ophthalmic Officer.

Tertiary Level

Keratoplasties are performed at a limited rate due to the lack of donor material. The success rate of keratoplasty done for typical trachomatous vascularized corneal opacity is very poor.

The missing links in trachoma control are knowledge, attitude, and practice. Cultural differences must be taken into consideration; and studies should be culturally aware and population-specific. Evidence shows that mass treatment can change the level of endemicity of trachoma; however, it is too expensive in most countries where trachoma occurs.

SUMMARY

In summary, blindness from trachoma, which is still a major problem in most African countries, requires cost-effective programs

that are undertaken only after understanding the cultural and social background of the population at risk. An ophthalmologist is not the most effective staff member to tackle this problem. Clinical Officers, nurses, and health orderlies should communicate directly with the community. Most important is the participation of the community itself in control of trachoma. Mass chemotherapy by use of tetracycline is still preferred for active trachoma and should be supplemented by appropriate health education on face washing, personal hygiene, waste disposal, and overcrowding.

8

Low-Cost Spectacles

Dr. Francisco Contreras

One of every five persons and 15 percent of the school population in Latin American countries need eyeglasses to improve their vision and consequently their capacity to learn and work. Three of the causes of this situation are: the high cost of the eyeglasses, the lack of personnel to perform the refraction, and the fact that there is little interest to start low-cost spectacles projects.

Through the assistance of Helen Keller International, our project started two years ago with the creation of a small production unit in the National Institute of Ophthalmology in Lima, Peru. Production work began with an assembly phase, rehabilitating secondhand frames donated by Operation Eyesight Universal. This project began on a small scale trying to cover the demand of the outpatient department of the Institute.

More recently, our Institute designed a medium-term plan to further develop this project. The following stages have been established:

1. **Spectacles assembly (includes lens-edging)**
   The first stage involved the assembly of glasses produced in Peru and the rehabilitation of secondhand frames. This stage required some basic elements including an edging machine, which was easy to get inexpensively in the local market. Also, the Institute hired an experienced optics technician.

2. **Lens-grinding process**
   This is a future development phase that will require funds to get the necessary equipment. (We are not in this stage yet.)

EXPANSION OF THE PROJECT

This pilot facility is currently limited to cover the demand of patients of the Institute and certain ongoing activities, like the Cataract-

Free Zone programs. We must now expand this program to serve a broader population.

Such a project has to be economically self-reliant. That is, it must be able to meet its out-of-pocket expenses. The amount of money collected from patients, or raised from donors, must at least equal the costs associated with establishing and operating the production unit, including salaries, equipment, supplies, and future expansion.

To bring about the acceptance of this project by local opticians, we have followed two strategies. First, we have tried to explain that this program is dedicated to the benefit of only poor people, who would have no possibility of buying eyeglasses from opticians. In addition, we have developed a nine-month training course for opticians. Our first course, which had 35 attendants, included the participation of ophthalmologists and well-qualified opticians within the community. Practice was performed in our eyeglasses facility unit.

Finally, I would like to mention that we have collaborated with Helen Keller International (HKI) to prepare of a practical hands-on-guide called "Providing Low-Cost Spectacles: A Practical Guide," which discusses the economic and technical aspects of such a project. For more information, please write to HKI, 15 West 16th Street, New York, NY, 10011, USA.

9

Providing Low-Cost Spectacles and Eye Medications

Dr. Joseph Taylor

I am most grateful for this opportunity of sharing with you all some of our experiences, which include both successes and frustrations, in trying to provide the bricks and mortar that are needed to implement the many national eye-care programs that are now springing up worldwide—a development which is due in no small part to the vision and energy of those who initiated this international forum.

I have had the good fortune (if I may be permitted a short historical digression) to be present at all the General Assemblies of IAPB since the first at Oxford in 1978. I well remember, on that occasion, having to defend the basic idea that the eye problems of the developing world need their own specific solutions. This is now the universally agreed upon basis of our discussions, which shows that a great deal of progress has been made in the past 12 years. However, with the rapid developments and intense sophistication of methods since 1978, we are in some danger of forgetting that, more than ever, we need to concentrate on developing our own solutions rather than taking over the norms of western methods of treatment.

The basic framework within which we have to work includes the increasingly difficult economic climate. Many annual health budgets are still less than $10 per capita. It is to this end that simple optical workshops, where finished lenses are put into standard frames (edging workshops), have been developed. This has occurred especially on the African continent, though similar endeavors are also to be widely found in Asia. Even the United States is not unconscious of this possible market. Those of you who pass through international airports will, I am sure, have purchased ready-made reading glasses between one flight and the next. I certainly have!

Often patients have travelled long distances to see an eye worker.

We must seek therefore to provide the needed optical correction on this same occasion, instead of sending them on a further journey with just an optical prescription rather than an actual pair of glasses.

A further development has been surfacing of optical blanks or, even more basically, the production of standard spherical lenses from window glass by use of a lens generator. These will be illustrated by the demonstration at the end of the Assembly by the optical workshops of East Africa, which I hope some of you will visit.

The production of cheap plastic frames is an everyday fact in India, China, and other countries of Asia, but awaits development in much of Africa and other more remote developing countries. However, the aim of having available to the eye patient a ready-made, finished pair of cheap glasses on his first consultation is well within reach. If the ministries of health, who often have surprisingly expensive drugs available in their medical stores, could be persuaded to add to their stocks ready-made spectacles, which are the "optical medicine" required by so many eye patients, then another important step will have been taken. One final word on this "optical medicine": patients do not demand a free pair of glasses. They expect them to be available and affordable—by which we usually mean the equivalent of one week's minimum wage or about $5–10. This is what should be our aim. WHO and Helen Keller International have produced useful booklets that set out the factors associated with the production of low-cost spectacles.

In the ever-increasing urban poor populations, we should aim at persuading the commercial optical outlets to produce affordable, ready-made glasses as part of their service to the community. Such spectacles should be made available in addition to offering the more fancy and sophisticated spectacles that are their present stock-in-trade.

An even larger number of eye patients require standard eye medications, especially antibiotic drops for common conjunctivitis and an affordable steroid preparation. Those medications available through commercial pharmaceutical outlets are usually unaffordable and, in any case, most of those who need the medication are completely remote from ordinary sources. Some of the commercial preparations are, in addition, professionally undesirable and misleading, such as the all-too-common steroid antibiotic mixtures.

It was with these constraints in mind that the methods for local production of eye drops have been developed. In principle, these methods use recyclable containers, and confine themselves to essen-

tial eye drugs, which are always generic preparation, not branded products. Good quality water is produced by distillation, which can now be done with solar energy; drops are prepared with a preservative and antioxidant agent to ensure maximal stability during heat sterilization; filtration removes particulate matter; then dispensing and sealing into pre-sterilized containers, and final sterilization of the finished drop in its container is followed by post-sterilization inspection before labelling and storage.

Eye drops prepared in this manner have proved to be of high quality and safety, at a cost which is only a fraction of the equivalent commercial product. Only one room is required for the whole procedure and, though expert pharmaceutical staff are to be preferred and are becoming more widely available for this work, even non-pharmaceutical staff specifically trained for the production of eye drops (often a member of the eye-care team) have proved acceptable so long as they have been carefully selected and are regularly supervised.

India and China are again in the forefront for producing cheap commercial eye drops; but even in those parts of the world, where these economical preparations are available, a considerable saving can still be made by local preparation. In addition, there is the extra advantage of having the drops available when and where they are needed. WHO has been a real stimulus, not only in the promotion of a model list of essential eye drugs, but also in the production of a manual for the local production of eye drops, which will be available shortly.

There can be no doubt that, as national eye programs develop, the need for affordable and available spectacles and eye medications will increase; and I feel certain that the commitment and hard work required will not be lacking. IAPB will, I am sure, continue to provide the inspiration and political impetus to achieve these goals.

10

Use of Portable YAG Laser to Treat Glaucoma

Dr. Henry S. Newland

Recent survey data indicate an economic blindness rate in Myanmar (formerly Burma) of 2.59 percent or 25.9 per thousand population; the WHO-recommended acceptable rate is 5 per thousand. Cataract accounts for 75 percent of this blindness, with glaucoma and corneal disease being responsible for most of the remainder. Unfortunately, no population-based data exist on the prevalence of glaucoma, including rates comparing acute angle-closure glaucoma (ACG), chronic angle-closure glaucoma (CAG), and open-angle glaucoma (OAG). Hospital statistics in 1983 indicate that more than 80 percent of glaucoma that is treated in hospitals is ACG. This is confirmed by similar situations in other Mongoloid populations. There is a preponderance of female glaucoma in Myanmar and more epidemiological data are needed to identify patients at risk.

Many ACG cases present late as absolute glaucoma—for which treatment, either medical or surgical, is of little or no use. Many of these patients, particularly those from remote and rural areas, refuse prophylactic surgery on the fellow eye (which has good vision) because they are afraid of losing their only seeing eye. Medical treatment, if available, is expensive after the patient has been discharged from hospital. Screening the population for ACG and OAG will be difficult without accurate epidemiological data to identify patients at risk, who then will be difficult to convince to accept treatment. It is likely, however, that a noninvasive treatment would be acceptable to those individuals who have suffered an attack in one eye.

The surgical YAG laser provides an alternative noninvasive tool that was not portable until recently. Prophylactic surgical treatment for glaucoma requires admission to a hospital, and many patients live too far away. There are also complications, and therefore many patients are frightened. The portable laser represents a major

advance in technology and opens the possibility of its use in the field to create a full thickness hole in the iris without opening the eye. As with any surgery there can be complications, including increased intraocular pressure, bleeding, and inflammation. The aims of the laser trial in Myanmar were as follows:

1. To assess the feasibility of using a portable YAG laser as a prophylactic measure.
2. To demonstrate the use of the Nd-YAG laser and to train local ophthalmologists to operate the system.

Several field trials have been carried out with the Q-switched Neodymium-YAG (Nd-YAG) laser, which has been shown to be an effective instrument for producing iridotomies in pupillary block glaucoma. This laser has been found to require fewer pulses for iridotomy formation, there is less chance of iridotomy closure, and it is a smaller and lighter instrument than the previously used Argon laser. The use of this laser system, its durability, and the results of treatment will now be presented.

METHODS AND MATERIALS

The system used was a 7905 Nd-YAG laser (Coherent Medical) which is slit-lamp mounted and carried in a padded reinforced case weighing 26.3 kg (54 lbs) and measuring 58 X 43 X 29 cm (23 X 17 X 11 inches). It has an energy range in millijoules to 10 and is air cooled. It may be operated using a self-contained battery located in the slit lamp mountings or with 120 or 220 volts AC. For this trial the local 220 volt power supply was used. The system was easily transported in all modern forms of transport including aircraft, vehicles, and trains.

The Eye, Ear, Nose, and Throat Hospital in Yangon, capital of the Union of Myanmar, is the major referral center for the country where an estimated 75–100 new cases of acute-angle closure glaucoma are seen every week. There are 75 ophthalmologists in the country, 32 of whom were selected to participate in the trial. Subsequently, the system would be taken to the field and operated by ophthalmologists in different regions. In addition to the 7905 Nd YAG laser system, a Schiotz tonometer, a three-mirror contact lens, an Abraham YAG iridectomy lens, and appropriate ophthalmic pharmaceutical agents were on hand.

The effect of YAG laser on paper was first demonstrated at the

slit lamp and then each ophthalmologist watched the procedure being performed through the observer tube. On the next patient the ophthalmologist performed an iridotomy under supervision. On entry into the trial, each patient signed an informed consent. The Snellen visual acuity was determined and an ophthalmic examination was performed, including slit-lamp examination, gonioscopy, and Schiotz tonometry. Patients with a gonioscopic narrowed anterior chamber angle approach without visible ciliary body for 180x (without indentation) were included in the study, as were patients with elevated intraocular pressures. Each eye had preoperative 2.0 percent pilocarpine hydrochloride and 0.1 percent dexamethasone drops administered prior to treatment. The portable 7095 Nd-YAG system was operated on existing hospital and office furniture.

The treatment protocol followed was similar to that for a field trial in Eskimos.[1] Topical anaesthesia was applied using amethocaine drops. The Abraham YAG contact lens was then applied to the eye. All eyes were treated peripherally in the superior nasal quadrant aiming to produce an iridotomy within an iris crypt. A standard energy setting of 6–8 millijoules in one pulse was used in the first instance.

If at the first attempt the iris was not adequately penetrated the energy level was increased and a repeat attempt was made. If pigment or blood covered the iridotomy site, a second site was then chosen in the superior temporal quadrant. If bleeding occurred from the iridotomy site, then light pressure was applied to the Abraham lens until bleeding stopped.

All eyes were observed for two hours postoperatively through slit lamp examination, Schiotz tonometry, and visual acuity testing. Topical dexamethasone drops were continued until the last postoperative visit at one week.

RESULTS

A total of 26 patients were presented for YAG laser iridotomy. All 28 eyes in 26 patients had thick, brown, velvet-like irides. All but one eye had crypts. Postoperative intraocular hypertension was treated when necessary with acetazolamide (500 mg twice daily). Fifteen of the 28 treated eyes (54 percent) had elevated IOP at two hours. Bleeding occurred in 12 eyes, but was easily stopped with digital pressure on the lens. There were no hyphemas. Minimal inflammation occurred in all eyes and was resolved with topical

steroids. Postoperative anterior chamber inflammation was mild and there was no activity in any eye after the first postoperative day.

The mean energy required for a patent iridotomy was 9.25 millijoules. Most eyes had pigment present in the anterior chamber on the first postoperative day but not later. Bleeding occurred in six eyes. No corneal or lens damage occurred and all iridotomies were patent at one week.

All ophthalmologists were competent at performing iridotomies at the end of the trial. The laser system functioned well. Forty additional patients were subsequently treated throughout the regions, but at the time of writing the system was unserviceable, apparently because of insufficient laser power. The one unsuccessful iridotomy patient, an Indian male, has since undergone filtration surgery.

DISCUSSION

In all eyes but one, a patent iridotomy was successfully made, with major complications being iris bleeding and elevated intraocular pressure. No visual acuity loss was noted. The follow-up time is now six months, and all iridotomies are still patent.

Ten millijoules in one pulse appears to be an ideal energy level for successful iridotomy. Fifteen of the 28 treated eyes had a postoperative intraocular pressure elevation at two hours, despite preoperative pilocarpine and dexamethasone. All returned to normal levels at 24 hours.

There is an urgent need to collect comprehensive data on the prevalence of angle-closure glaucoma in Myanmar. The 7905 Nd-YAG portable laser system may be a valuable tool in treating acute glaucoma prophylactically, particularly in remote areas where there are few health-care professionals, but such treatment must be reserved for those at risk because resources are limited. As with any high-technology equipment it is important that adequate back-up be provided for this system. It is hoped that with adequate service facilities this laser system can be used in the prevention of blindness due to pupil-block glaucoma.

REFERENCE

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11

Eye-Health Education and Social Marketing

Dr. (Mrs.) Gopa Kothari

There are at the very least 27 million blind people in the world and perhaps 30 million more with severe reduction in vision. Unfortunately, these numbers are increasing. The major blinding eye conditions in the world are cataract, trachoma, glaucoma, corneal ulceration (particularly associated with vitamin A deficiency and measles in children), onchocerciasis, trauma, and leprosy. These major causes of blindness have different patterns in the developing and developed world. Up to 80 percent of this blindness is avoidable. This means it could be cured or prevented within the limits of resources that are available in the country or region in which the blindness occurs. The challenge is to develop eye-health education and care for communities, and also to allocate resources according to priorities that will allow substantial reduction in the number of people who are blind.

Health has to be attained, it cannot be imposed. The communication of health-education information facilitates participation in positive community actions. The first requirement for the attainment of eye health is a commitment to this goal by both the people and the government.

In developed as well as developing countries, there are many diverse economic conditions, living standards, literacy levels, languages, and social customs. Eye-health education activities should be tailored to the specific needs of the people for whom they are meant. This enables adequate utilization of the available resources. It is vital to provide education about the prevailing eye-health problems and the methods of preventing and controlling them. This is the first of eight essential activities in primary health care. A new look at eye-health education is essential.

In calling for new approaches to eye-health education in primary health care, we must recognize that no aspect of eye care is static.

To make health education more effective, it is essential to tailor the educational information to the prevailing lay and professional perceptions of eye-health problems.

Originally, health education developed along the biomedical views of health and disease current at the time. Social, cultural, and psychological factors were thought to be of little or no importance. The assumption underlying health education activities was that people would enjoy better health if they would act in the manner recommended by health workers. The emphasis, therefore, was on the transmission of correct health information to the general public.

Eye-health education was developed, as the outward and downward communication of eye-health knowledge to individuals with limited ideas on how to avoid illness or cope with diseases. In the early years, relatively little effort was made to understand people's traditional health beliefs and practices and to consider these beliefs in developing health-education strategies. Although some attempts were made to learn what the communities themselves regarded as their health needs and priorities, the attempts were not systematic. Rather, it was assumed that only health professionals were in a position to assess these needs and priorities.

Furthermore, eye-health education has been operating almost entirely within the value system of professional allopathic medical services. Its goals have been set within that framework and its achievements are measured in the patients' compliance with treatment, the reduction of hazardous health habits, and the reduction of the period between the beginning of an illness and that time when the patient seeks treatment. In the past, health-care providers have focused mainly on the modification of individual behaviors, implying that the individual is solely responsible for his plight. This approach blames the sick, the poor, and the miserable for their illness, their poverty, and their misery. It ignores the fact that in a number of situations it is not the individual who needs to be changed but the social environment in which he or she lives. The political, economic, and environmental factors that have a negative or neutralizing effect on healthy behavior need to be modified.

What, then, is the proper role of health education? The Director General of WHO has clearly outlined the areas where new thinking is required:

1. Health education needs to develop new policies in harmony

with the principles of primary health care and the strategy of health for all by the year 2000.

2. Health education needs to facilitate the development of human resources with the skills to translate social goals into educational objectives for health for all by the year 2000.
3. Health education needs to reflect on the educational technology most appropriate to promote individual and community involvement and self-reliance.
4. Health education needs to strengthen its multifaceted approach and to increase coordination of health education efforts through appropriate technology.
5. Health education must pay greater attention to monitoring and evaluation.

From this perspective, priority must be given to the development of a people-oriented eye-health technology to meet the needs of the general population, while giving appropriate consideration to the needs that are recognized epidemiologically to require urgent attention.

Eye-health education has a powerful new role to play in promoting the involvement of lay persons in eye-health care. The role will require:

1. Reorientation of techniques and social analysis.
2. New educational methods that aim to enable people to identify and assess eye-health problems and to give them confidence in solving those problems.
3. New ways of creating links between key groups in the community and of negotiating solutions for eye-health problems.

We must keep in mind that the rapid proliferation of community-based health-education programs has outpaced the knowledge base of behavioral change strategies that are appropriate and effective for public health interventions.

Health in its widest sense can be considered as a consumer product. If people do not want health, they will not make an effort to "buy" it. Producers and sellers of goods have marketing techniques and approaches that are highly efficient. Can these same techniques be applied to selling health?

Experiences of various programs and other public health education efforts, especially in the fields of population, nutrition, and

agriculture extension have pointed to the usefulness of social marketing principles in formulating and implementing broad-based behavioral change programs.

Social marketing represents a bridge that links the behavioral scientist's knowledge of human behavior with the socially useful implementation of this knowledge. It offers a useful framework of effective social planning at a time when social issues have become more relevant and critical.

The important aspects of social marketing that can be applied to eye health include:

1. A program that can increase the acceptability of ideas or practices in a target group.
2. A process that can solve the problems using marketing techniques.
3. A process that applies marketing thoughts to the introduction and dissemination of ideas and issues.
4. A strategy that can translate scientific knowledge into effective educational programs by developing effective communication strategies.

For social marketing to become successful and have durable results for eye-health education programs, it is necessary for the social marketing techniques to be based on an analysis of people's wants and needs in a given area, to develop a well-conceived model, and for this program to appeal through mass and specialized communication media to the targeted audience.

Today social marketing techniques for eye health need to concentrate on creating awareness about various eye problems, the importance of promoting prevention, the availability of curative services, and the need for effective utilization of the existing infrastructure. The challenge for social marketing is to create awareness, to reduce barriers for treatment, to make people come forward for eye care, and to see that they are satisfied with the treatment. This will enable behavioral change.

To use this powerful and useful tool of social marketing for eye health, it is necessary that we are clear about: What are we selling? Who are we selling it to? How are we selling it? On this basis, a social marketing plan for eye health can be developed.

1. **What are we selling?**

   Broadly we can say that we wish to sell awareness about

existing eye problem practices, reduction in eye problems, reduction in complications, and services or methods that can reduce blindness. Our aim is to sell change in behavior, lifestyle, and risk reduction by utilization of existing eye services. Demand for more eye-care services will result in improvement in eye health.

2. **Who are we selling it to?**
   We have to sell this to the target group who may or may not be able to pay for the eye services. We must supplement the existing government program that can result in the improvement of eye health in the target group.
3. **How are we selling it?**
   We can best sell eye health through the mass media and the training of ophthalmologists and paraprofessionals working in the field of eye care.

Advertising in television, radio, cinema, billboards, posters, banners, newspapers, and written messages are important. The production of health-education materials and manuals for primary health-care workers and local leaders of community organizations can also play a very important role in increasing knowledge, changing attitudes, and modifying behavior through the cumulative effect of health messages.

The training of professionals and paraprofessionals working in the field of eye care will help them to act as facilitators of healthier behavior. Such training promotes the two-way transfer of technologies between the ophthalmic system and the community. It also leads to the recognition of the contribution of professionals in other sectors. For example, environmental support can ultimately result in promotion of eye health.

Social marketing principles are especially well-suited for the task of translating complex educational messages and behavioral-change techniques into concepts and products that will be received and acted upon by a large segment of the population. However, it is not magic that works in all circumstances. Even when correctly applied, social marketing has its limitations. Brief social-marketing campaigns cannot be expected to result in substantial cognitive and behavior changes. Their strategic and continuous application, however, is viewed as a necessary condition for effective public health intervention.

A new approach is necessary for eye-health education to increase

the effectiveness of individual counseling and small-group programming. Penetration of individual-based or group-based eye-health education methods into many hard-to-reach segments of the population and the development of programs that cause changes in the population with existing resources and technology will effect such positive movement.

As we face the worldwide increase in blindness there is a need to develop a comprehensive educational program that will help to prevent blindness through early diagnosis. This will increase the community demand for better eye-care services. In order to achieve our objective we need to use multiple channels and multiple communication methods. We need the alliance of communicators, health professionals, media professionals, religious leaders, community leaders, trade union leaders, teachers, employers, business leaders, schoolchildren, popular personalities from the entertainment industry, and advertising and media experts to make it possible to consolidate the gains of each group for better eye health.

All educational tools have shortcomings. Multiple disciplines: social marketing, behavioral analysis, and anthropology, which have significantly influenced public health communication, are therefore advocated. Social marketing can be the basis for health communication of eye care. Behavioral analysis focuses on existing eye-health practices and identifies areas of possible change for better eye-health and anthropological investigations. These efforts can lead to the development of comprehensive eye-health education. A promotional program for eye care thus keeps in mind consumer's needs, practices, and preferences.

Public health communication provides a strategy for planning and conducting long-term eye-health education programs that can enable people and communities to make their own decisions on the matters of eye health. Whereas creating awareness through social marketing may be a step in the right direction, behavioral analysis and anthropological investigations should initiate the cyclical nature of the process. The programs developed should result in the increase of knowledge regarding eye care, mobilization of the resources, and the development of the community participation needed to control eye problems. We hope that all of this will ultimately result in the reduction of the number of visually handicapped and blind individuals in the world.

12

Management Issues in Primary Eye-Care Training Programs

Ms. Victoria M. Sheffield

Programs must be planned properly *before* the training actually begins to avoid delays and additional costs.

A primary eye-care training program should address: design, staffing, time, costs, curriculum and materials development, and monitoring and evaluation.

A needs assessment should address: the most common eye conditions, the location and aptitude of available health personnel, the facilities available for training, the identification of the trainers, and what the health workers are allowed to do by law.

Planning is essential and at least one fourth to one third of the project's entire time should be devoted to planning government agreements, conducting meetings with all appropriate counterparts, designing and field testing training materials, and preparing for unforeseen difficulties such as floods, strikes, and political unrest.

Materials for various levels of staff should be prepared. For the administrators or policy makers, a document such as the WHO's "Strategies for the Prevention of Blindness in National Programmes" is excellent to inform these people of the reason and need for training health workers in eye care. At the tertiary level, ophthalmologists may profit from information of a public health nature so they understand the impact of blinding diseases on the population-at-large. At the secondary level, more technical information is appropriate. And at the primary level, you will usually have to use the local language to prepare appropriate materials especially for the health workers.

An extremely important consideration which must be made at the *beginning* of the program is that of motivation. If you are going to train health workers to perform additional duties, what will be their incentive? Often, it is recommended that graduates be

upgraded or moved up for consideration for promotion, which in turn rewards a raise in pay.

Ophthalmologists may not be the best trainers. Whereas health educators, especially those with eye-care experience, are ideal. Trainers need to know other methods such as demonstration, practice, role playing, and how to use the audiovisuals.

You need to find suitable training facilities. Comfort and room size are extremely important, especially in the afternoons in hot and humid climates. Electricity is necessary if you want to show slides or videos. A hotel is often a good place because it usually has a hall, which may be used as a disco at night. Of course, the hotel can also accommodate the trainees with room and board during the seminar.

Concomitantly with the above, appropriate training materials must be designed, field tested, and produced. This requires good writers and artists. There must be film-developing services available if you are to produce slides depicting local conditions. What are the printing services available so that materials and posters can be produced locally? Most importantly, you need to have enough time to *field test* your materials with the target audiences and make necessary revisions. You must consider future needs for materials and the availability of services to produce additional supplies.

To know how well your program is performing and impacting on the problems being addressed, a monitoring and evaluation plan must be included from the very beginning. With regard to the trainees themselves, pre-and post-tests are valuable to determine what they have learned in the training. A post-test can be given again after six months or one year to determine if the trainees have retained the information they have learned.

Trainees should be taught how to correctly record their findings in an eye exam, especially if the patient needs to be referred. Additionally, trainees should be taught how to properly report their activities to their supervisors on a scheduled basis, either weekly, monthly, or quarterly. This information can then be analyzed to determine many factors such as patient usage of clinic services, numbers of patients seen, treated, or referred. A training program should understand how health workers are supervised, and such information should be included in the program and used especially to instruct the trainees about reporting. Because continuing education is important, a plan for this should be included in any training program.

Do not raise expectations. Health workers should be trained to do what is appropriate for their level and what is allowed by law. If they are trained to do more than is appropriate for their situation, they will become frustrated and lose interest in eye care.

Training must fit the actual practical situation. Health workers who are trained in a similar environment to their own working conditions and with similar resources will be able to practice what they have learned. This will help build confidence and competence.

How we can look at what should be taught. A common definition for primary eye care is basic care for common eye infections, first aid for eye injuries, and the public health measures that promote and maintain general good health, such as hygiene and sanitation to prevent ocular infections, nutrition to prevent vitamin A deficiency, and safety to prevent ocular injuries.

We can ask if primary eye care is ophthalmology. What about blindness prevention, is it ophthalmology too? We teach health workers to recognize when something is wrong. Important tasks for health workers include: knowing how to recognize a problem, deciding whether to treat or refer, and teaching prevention.

The five rules for a normal healthy eye are: the cornea should be clear, the pupil should be black, the white part should be white, the eyelids should open and close properly, and the patient's vision should be normal.

The following format should be followed: cataract should be referred, conjunctivitis can be treated and prevented, trachoma can be treated and prevented, xerophthalmia can be treated and prevented, injuries can be treated and prevented

Health workers must be taught the following basic skills: how to perform an eye examine, how to measure and record visual acuity, how to evert an eyelid, how to apply drops and ointment, how to make and apply an eye patch and protective shield, and how to remove a foreign body from the eye.

Eye-care workers often do not make the connection that public health measures can also prevent blindness. They must understand these principles when talking to community groups about blindness prevention. Important groups to target for these activities include: women's groups, schoolchildren, church groups, social clubs, professional clubs, and the general public during mass screening campaigns. Social marketing techniques can be employed to encourage people to expect and demand eye-care services and even to know how to prevent their own eye problems.

Again, hygiene and sanitation prevent ocular infections. A balanced diet and food preparations for infants that include vitamin A prevent xerophthalmia. In addition, safety education can prevent ocular injuries.

Messages can be disseminated through the use of the radio and newspapers. Posters and pamphlets work well if your program has the time and resources to produce these appropriately.

And lastly, we must always remember about appropriate technology. Whatever we do must be appropriate for the audience being trained or targeted.

PART 6

PLENARY SESSION V

Sustainable National Program Development

WORLD BLINDNESS AND
ITS PREVENTION
VOLUME 4

1

Starting a National Committee for Prevention of Blindness

Dr. Lincoln Agaba

Be it religious, political, or health-related, establishing any sustainable national program is a herculean task. One major hurdle, especially in the developing world, is the need to justify the commitment of limited resources to a prevention of blindness program.

Although obvious to an ophthalmologist trained in primary eye care, it can be confusing to an uninitiated ophthalmologist. It is the duty of trained primary eye-care workers to explain to their colleagues as well as to the Ministry of Health why a national committee is essential. Failure to gather enough facts can result in the failure to convince the administrators of the necessity of forming another body in the Ministry. In addition, budgetary constraints amplify this problem. The fact that your program will eventually be cost-effective must be made clear and supported with facts. It is important to note that the meager budgets of ministries of health range between 2 and 5 percent of their national budgets in some developing countries.

The facts need to be made tangible, and eye workers should be the demonstrators. Opening a dialogue with the Ministry of Health is a good first step. The Director of Medical Services and his deputies must be given adequate exposure to understand that blindness is a problem that can be solved with primary eye-health programs under the auspices of a national committee for the prevention of blindness. Friendly local and international NGOs should be contacted and told that their contribution may ease the pressure from the Ministry of Health. Their experience or a promise of financial assistance can be very helpful.

The director or senior deputy of medical services should be convinced to take the chairmanship of the committee and the patron should represent the Ministry of Health. This way, the committee is in communication with the top officers of the Ministry. In other

words, you need a friend in the top echelon of the Ministry of Health to understand your language. We, on the other hand, had to sit down as eye workers in the Uganda Foundation for the Blind to write up a document to market and sell the prevention of blindness program.

Loopholes left in the document will upset government planners, who are usually not eager to have new programs. In Uganda these political machinations took three years to become effective (from 1983 to 1986). A Minister with good insight into the problem listened and inaugurated our committee in February 1986.

A document, the content of which should be broad, needs to be prepared. Other ministries should be involved in making decisions concerning the committee's formation and funding. Demographic data (population, age, and sex distribution) are vital in both urban and rural areas. These statistics are important because blindness is directly linked to these factors.

The document should be clear about national health-care systems. Government health policy, structure, the role of government in health care, and the involvement of universities and medical schools should be laid out without ambiguity. We were sent back several times to consult with such institutions.

Other points to consider include the magnitude of the problem of blindness, the major causes of blindness, the possible sources of funding, and the objectives that are long-term (reduction of blindness to 0.5 percent by the year 2000), medium-term, and short-term (relevant training programs for eye workers) with recommendation of measures to achieve them.

I must say that Sight Savers, WHO, and our local Uganda Foundation for the Blind were instrumental in the inception of our committee. After our establishment, Christoffel-Blindenmission contributed greatly to the committee's efforts. Funding for training, the backbone of marketing the committee's new philosophy, was a major priority for the National Prevention of Blindness Committee. Outreach, research, cheap eye drops, and glasses were also effective ideas to show government planners.

The committee must be a multidisciplinary one. It cannot be for eye people alone. The health inspector and the district agricultural officer are important players in the prevention of blindness. We approached them as we fought for the committee to be established.

Let me illustrate the bureaucratic problems of one of our major projects. We decided to start a school for ophthalmic clinical

officers. We wrote to the authorities on July 22, 1986. The reply came on January, 27, 1987, and read as follows: "I refer to your letter of July 21, 1986, and regret the delay in replying. This was due to the rather slow process in consultation of the matter. The Director of Medical Services responded while I was on leave, thus the delay. We have now come to the agreement that we would need to draw complete training proposals for submission to the Public Service Commission and Finance for approval before we embark on the training. This is based on the past experience of training cadres without approved titles and posts and then failing to appoint them. The result was frustration, and the trainees abandoned the new skill for their original positions. It would be unfair if we did not learn from that mistake. Besides, we prefer to conduct full Diploma courses in preference to ad hoc programs.

"I am now inviting you to bring a detailed proposal stating title, entry requirements, training period, entry point to service, salary, promotional avenues, numbers per year, and justification for further discussions with our Personnel Division and eventual submission to Public Service Commission."

These are late but fair questions of which the committee must be aware. The answers were submitted. Public Service came and we had discussions. The Permanent Secretary wrote a letter to the Ministry of Health on the 9th of June, 1988. The Finance Ministry confirmed on August 22, 1988.

This ping-pong continued but we finally succeeded in impressing upon the government the role of the committee and the necessity for its formation. A proper incremental salary system after graduation was agreed upon. Other paramedical workers often start without this benefit. Without it they might have gone back to being general Medical Assistants, deserting the new job.

The three ministries also agreed on a promotional ladder for ophthalmic clinical officers that rewarded diligent performance. Promotion to senior ophthalmic clinical officer grade II and later to grade I as a ceiling level, with a salary the equivalent of a doctor's, is possible.

The school eventually started in 1989 and RCSB agreed to fund this school with some support from the government. We are grateful to RCSB. May I mention Mr. Alan W. Johns, Mr. Paul Streets, Mr. Kevin Carey, and Dr. Randy Whitfield for their tireless efforts.

The negotiations with the government took months. One must go to the Ministries of Health, Planning, Justice, Finance, and Public

Service for clearance to sponsor a school. When this project finally got started the committee's morale improved. We are now called upon to chair and advise the onchocerciasis committee, the trachoma committee, and others.

Our committee is now in the forefront of onchocerciasis, trachoma, and cataract programs, advising the patron and the Director of Medical Services of shortcomings, but funds remain a problem. Procuring eye drops and inexpensive glasses is still a big challenge to the committee. With assistance from the WHO and other departments of the Ministry concerned with primary health care, outreach work is beginning mass mobilization.

Mr. Chairman, the strength of the committee will depend largely on constant pressure from their members and clearly researched programs. With these two elements the committee will not fail.

2

Raising Funds to Develop a National Program

Dr. R.P. Pokhrel

The national program of blindness in any country depends upon the leadership of the program manager, the basic infrastructure, the commitment of decision-makers, good communication and coordination between the appropriate bureaucrats and professionals, and active community participation. The success of such a program requires the leadership to be dedicated, to have powers of persuasion, and to possess in-depth technical knowledge with a clear conception of the goals of the program. It will also require the teamwork of a few dedicated social workers and professionals who understand their society and their government. You have to work very hard to motivate the decision-makers and the community leaders to convince them; but once they have developed confidence in you, you will get all the support you need.

When I returned back to Kathmandu in 1971 after my training in England, I was a very junior surgeon posted in an eye department in a general hospital in Kathmandu. I had very little private practice and I had to go in remote areas with mobile eye camps visiting various rural areas and meeting people, community leaders, and social workers. This activity gave me tremendous exposure to the socioeconomic conditions of the country and an in-depth knowledge of the problems of blindness which inspired me to start a separate eye hospital with public support.

I worked hard talking to social workers, various NGOs, lawyers, industrialists, and the professionals in the field. I also started writing articles convincing the people through local newspapers. Eventually I was able to organize a group of dedicated social workers to form a committee to launch the Nepal Eye Hospital. I had several obstacles, first from my own ophthalmic colleagues, then the Ministry of Health, but without offending them, I started working singlehanded on this program during off periods. I even donated all of

the basic eye instruments and equipment, because in the beginning I had to start everything from scratch.

I would like to share with you some of the experiences one might have while operating such an eye-care program. When you start the program, people will not know you first, so they will not have confidence in you. Unless there is confidence, you will not get their support; and until you win the backing of the people, the government, or sources of external funding you cannot run the program. Everybody will just watch you to observe your dedication, sincerity, technical capability, behavior, and the society you move in. You have to prove that you are sincere in your profession, dedicated in your service, and trustworthy in your accountability. Many so-called social workers in the past have taken donations from the public and have misused the money. Therefore, because people will be very careful and watch every step, it is important to keep the organization's reputation spotless. Regular progress reports, annual auditing, effective communication, and assiduous dedication will win confidence in the program both internally and from the outside world.

Regarding the eye-care services, you do not need advertising but rather a competent and sincere approach. You must consider each patient, whether rich or poor, as an ambassador of your program. If he or she is impressed by your organization, he or she will convey a positive message to the community. Therefore, the selection of correctly motivated staff is very important for the success of your program.

Blindness prevention and control programs in many developing countries are often planned and initiated with foreign support. To avoid continuing dependency on foreign assistance, each program should try to generate its own income from the very beginning so that it can sustain its services even after the foreign support has been withdrawn.

The success of income-generating activities will be dependent upon hospital location, the economy of the country, the regulations of the government, the effectiveness of the local prevention of blindness society, and the hospital management.

SELF-SUFFICIENCY

To reach self-sufficiency two main principles have to be worked out. The first is to maintain operating costs at a minimum from the very

beginning, and the second is to develop successful income-generating activities wherever possible. Keeping operating costs low will provide savings and income-generating activities will give you earnings and means of continued support. Now let us see how we can save on the operating costs.

1. *Staffs:* Engage a minimum number of highly qualified staff. Give preference to the local staff, and train them according to the needs of the hospital needs. It is preferable to train them within the country, or at least within the region, and utilize them as multipurpose hospital workers.
2. *Relatives of patients:* Involvement of patients' relatives in patient care minimizes the need for hospital nursing staff and guarantees better food preparation and better care for the patients.
3. *Equipment and materials:* Use locally available materials for preparing swabs, eye pads, bandages, OR table, beds, etc.
4. *Appropriate technology:*
   - Self prepared suture: a piece of 8/0 silk which is threaded through an eyed corneal needle. The needle can be reused hundreds of times.
   - Sterilization of cataract sets and newly prepared sutures in a domestic pressure cooker.
   - Simple freon-cryo system: one kilogram of freon costs $3.50 and lasts for about 1,000 cataract extractions.
5. *Maintenance:* Sharpening of cataract knives, needles, scissors, other surgical equipment, and instruments can be done by hospital staff without sending them outside.
6. *Use of building materials:* Wherever possible locally available building materials should be used for hospital construction and the hospital should be designed in such a way that the maintenance costs are kept to a minimum.

INCOME-GENERATING ACTIVITIES

In most developing countries, because there is no health insurance to cover medical treatment, the majority of patients cannot afford the costs of modern medicine. Patients who are able to

pay should pay for treatment, but those who are unable to pay the full costs should pay what they can or even receive their treatment free of charge. However, we should encourage patients to pay even a small amount.

Income-generating activities of the hospital are as follows:

1. *Charging for services:* These might include costs associated with registration, refraction, special investigations for glaucoma, visual field examinations, retinal examinations, and pathological services.
2. *Selling eye medicine:* One can buy medicine at a wholesale price and sell it at a retail price. This practice, which could return a profit as high as 16 percent, will cover the costs of the medicine given to those patients who are poor and will not be charged full price. Another advantage is that we can be sure that the patients will receive the correctly prescribed medicine and the patient will be taught how to apply those medicines correctly.
3. *Charging for surgery:* The cost of a cataract operation should not exceed the minimum basic salary earned in two weeks by the individual. The cost of the operation should include spectacles and eye drops and should be a fixed amount. The patient should be made aware of this cost and be asked to save that amount of money before he or she visits the hospital for surgery.
4. *Charging for private rooms:* Private rooms with better accommodations will encourage people with high incomes to patronize their own country's hospitals for surgery; this will help stop the drain of the country's economy to neighboring countries. Although those who cannot afford to pay should be treated free or at a nominal cost, the quality of the service should be the same for all individuals.
5. *Farming activities:* If the hospital is located in rural areas and if it owns sufficient land, one can generate income by selling fruits, such as bananas, pineapples, mangoes, litchi, papayas, and medicinal plants cultivated within the premises. In addition, bee-keeping, agro-farming, and tree planting can generate income, which has been tried in various centers of Nepal.
6. *Leasing hospital shops and other accommodations:* If the

hospital invests capital in developing its own hospital, for example in constructing a shopping arcade or other accommodations to sublet, there is a good chance for regular income.

7. *Eye-drop production and local manufacturing of spectacles:* Local production of glasses will help train paramedicals and generate income for the hospital; and, if incentives are given for the sale of these glasses, it will help promote business. The production of local eye drops on hospital premises will help to support hospital patients whose treatment will be subsidized. During eye camps this production will generate income for operating the hospital. In addition, this freshly prepared medicine will be available for the needs of the patients.
8. *Production of IOLs:* Patients in developing countries cannot afford to pay for costly IOLs produced in developed countries. However, if it is within their range, most patients in developing countries can afford to pay such a cost. In recent years patients have demanded such surgery and have told the surgeons that they want to keep the optical correction inside the eye. Moreover, they have been willing to pay whatever money they can afford. This may be true in other countries as well. Because there is a growing demand for IOLs, there is a need to establish an IOL factory in Nepal. This, I hope, will generate some income to support the hospital, if the management and quality control are done effectively.
9. *Investment in real estate:* Take the advice of your legal counsellor and discuss investment possibilities with the managers of your bank and other colleagues. You might consider investing part of the savings in a fixed deposit that could yield up to 13 percent per year, which often is tax free for philanthropic organizations, or you could invest in property where there is usually an annual increase in prices.
10. *Family Trust:* The country may be poor but in each nation there are few individuals who are rich and want to maintain the name of their families by donating some property. Such donations can be a cash or a building or a plot of valuable land. The donors should receive adequate recognition from the public and from the government. Perhaps they

would like to make their donation in memory of one of their departed family members. Some families create a family trust and through that trust build the physical facilities, according to your advice. In addition, some will also bear the necessary expenses for the day-to-day operating costs.

In Nepal, the government has provided us with a huge plot of land for tree plantation and has also donated some very valuable land for the construction of a hospital. During the transfer of the property, they have waived all of the taxes for the organization. Two families have built 50-bed eye hospitals and are bearing the necessary expenses for the operating costs at the Golccha Eye Hospital and Kediya Eye Hospital respectively.

The Choudhary family has donated the very valuable land at Lahan and the hospital is named the Sagarmatha Choudhary Eye Hospital. Rana Bahadur Shah has donated land at Bhairahawa to build the Seva Eye Hospital and is going to donate $35,000 as a fixed deposit to meet some of the operating expenses. Similarly in Nepalgunj a very rich old person donated land and a beautiful building for the Fateh Bal Eye Hospital. Now many individuals are coming forward to donate their properties and to bear part of the operating expenses in cash invested as a fixed deposit. So far the Nepal Eye-Care Program has been able to generate $2.0 million in cash and $5.3 million in-kind through different individuals, social organizations, and the government—all within a period of 10 years.

11. *Personal Contact:* People's confidence on your leadership and positive recommendations by your patients and colleagues is important. A good project proposal and the support you receive from your government will also help to raise funds from various international organizations supporting eye-care activities. Some organizations may like to support training, others to clear the backlog of cataract, or to establish a trachoma program or a vitamin A program. A few may wish to support a physical plant or other facilities. You have to fit in those organizations according to your need without duplicating the services. Let individual organizations work independently under your supervision and guidance, according to your need.

Treatment of a dendritic ulcer and a support of a

satisfied patient brought me in contact with Operation Eyesight Universal, Canada. An eye camp and the recommendation of a German orthopedic surgeon brought me in contact with Christoffel-Blindenmission, Germany. The personal initiative of a Japanese surgeon working in mobile eye camps brought us in closer ties with Japan and then subsequent support for equipment and training. A dedicated Dutch ophthalmologist through a mobile eye camp brought about Foundation Eye-Care Himalaya, followed by eye-care programs in Gandaki and Dhaulagiri Zones. The most important thing in the program is your own initiative, dedication, and personal contact through various channels.

I would like to recapitulate a brief discussion during lunch at the WHO cafeteria in New Delhi with Dr. Nicole Grasset in 1978. That brief chat, which gave birth to the Nepal Blindness Program, also led to the national survey, training of manpower, the effort to clear the cataract backlog, and subsequent continued support from Seva Foundation, USA. Seva is the organization that is supporting not only our comprehensive eye-care program in the Lumbini Zone but has supported the establishment of the national program, health education and manpower planning, research and evaluation, and the program that allows Nepali ophthalmologists to attend various international conferences and to present various scientific papers.

My contact with Prof. Hollows from Australia as an STC to the Nepal Blindness Program has resulted in the Nepal Eye-Care Program, Australia. Through this program some ophthalmologists and paramedicals have received training in Australia. And, lastly, the support of the British Council has been most valuable and substantial in helping us to train our technical manpower.

3

Major Challenges and Priorities for the Delivery of Eye-Care Services

Mr. K.S. Gupta

The two most common challenges encountered in developing countries today are poverty and illiteracy. Both these factors directly contribute to the ever-growing problem of blindness. The devastating fact is that in India, where there are over 600,000 villages, at least 12 million people are blind. About 82 percent of this blindness pertains to cataract and cataract-related disorders that can be cured. About 1.4 million are able to have their eyesight restored through the efforts of NGOs and government agencies. And a rough estimate shows that about 6 million are added every year to the already huge backlog of blind people. This is alarming, and the task is a daunting challenge.

Let us take a look at a typical village in India. Such a village is generally located very far from any major health center. Thus, I will not be wrong in assuming that in any given village only a small percentage of people will have access to health care or a doctor—usually by virtue of his or her being in an economically better situation than the others. The rest of the population who are unfortunate, have to fend for themselves. This means that, if any health or eye problems arise, they will first try their own home remedy or go to a "quack" located in the village. Gradually they will become dependant on others because of their prolonged sickness, and finally they will die a miserable death. Is this what humanity is all about? We, at Lok Kalyan Samiti therefore decided to go to the doorstep of these villagers and provide what medical relief we could in our own small way.

Lok Kalyan Samiti has taken up the program of prevention of blindness and directly works in the area of cataract cure. LKS has so far performed more than 17,000 eye operations. We have been able to operate with a success rate of nearly 99.9 percent over all these years.

Our priorities are: raise funds, allocate funds, select villages, screen people, and provide a high level of health-care service.

Now to elaborate on each: At one time India had only very rich and very poor people. Today there is a large new middle class that has been growing at a very high speed and has a fairly large disposable income. We at LKS have approached this middle class to collect funds because these people see the problem on a one-to-one basis and are more willing to part with their money.

This middle class is made up of people who are easy to approach; they respond favorably to a good cause and derive satisfaction at the thought of sharing their money with their poorer brethren. At LKS we thus make them partners in our fund-raising drive. These are often people who have also seen or experienced poverty at some stage in their own lives.

When you approach the higher income groups, the response is totally different. Apart from viewing with suspicion the whole cause you are representing, they ask you to return again and again until you either give up, or they finally decide to contribute a small amount, just to get rid of you. This becomes a frustrating exercise, and often all of the enthusiasm with which our LKS fund-raising exercise began vanishes outside these palatial houses. Therefore, we have learned to avoid these people on the top income group. However, we do have some donors from this group who have heard of us and come forward to donate directly. But this forms a very small percent of our donations.

After the funds are raised, we must budget and allocate them. First, eye operations are given priority and a certain sum is put aside for this. The balance of funds are allocated for other health-related programs undertaken by LKS.

As a parallel exercise, LKS's social service teams visit nearby villages and create short lists of the most needy cases to be taken up for the forthcoming batch of eye operations. Subsequent to this, LKS's medical van revisits these listed villages to select people on a priority basis for the operations.

After this, from the time they are brought to the eye hospital to the time they are discharged after the operation they are given excellent medical and personal attention. Though these services at LKS are totally free for them, they are treated on par with other patients who are treated in class A hospitals.

Thus the entire process goes on endlessly. And every stage proves to be a new challenge. However, LKS has its own limitations

at any given time. We could have taken on a much larger number of patients, if we had been willing to compromise the quality of services offered. But we have preferred to concentrate on extending the best service to the number of patients that we are able to take on.

The general belief is that anything that comes free, must be of substandard quality. We at LKS wish to correct this impression. Any person who visits the LKS hospital will see that there is no discrimination between the rich and the poor. They are all treated as equals. We have made all our patients and donors partners in our program.

We do this by involving them in the whole process and by keeping them informed. They then feel good about our cause, and often they become our spokesmen in their own villages. But we do not force our views upon them. Not only do they become our partners in fund raising, they also feel responsible to take care and extend the facility to the rest of the unfortunate ones living in their villages. Thus they instill confidence in the minds of others who have not heard of LKS and are frightened of visiting any medical institution. Although we do not claim anything on our own, the good work that is accomplished speaks for itself.

The entire cost of restoration of eyesight and productivity as well of a person costs Rs. 500. But we are asking our donors for only one fifth of this, Rs. 100 per operation, because we do not want to ask for an amount that is too much. As far as international fund raising is concerned, we have been receiving funds from several well-known agencies. Operation Eyesight Universal (OEU), of Calgary, Canada, has been giving its full support since 1979. Our quantum leap towards self-sufficiency would not have been possible but for the support of the OEU. Besides these agencies, we have been getting support from other well known clubs like Rotary, Lions, and various trusts, associations, and individuals in India. We are now meeting 80 percent of our total costs from the funds raised within India.

FINDING DONORS

The majority of our donated funds is raised by way of direct mail. Apart from formulating lists of donors ourselves, we seek the help of various automobile associations and other clubs and prestigious institutions in India. Then we send our complete package directly

to them, using his of her personal name, along with a form for donation and a postage-paid envelope. The total cost of this mailer comes to Rs. 1.70 inclusive of postage. This is mailed to more than 250,000 people a year. Our past record shows a return rate of 3.5 percent. This is by no means small because the mailer is sent only to new potential donors.

The other source of funding is our advertisements, which are placed in national magazines like *Reader's Digest* and *India Today* on an as-needed basis. In addition, many advertisements, including a coupon that can be cut out and sent with a cheque, are published free of charge.

The last method is through word of mouth, either by the beneficiary or by the donor himself. Once the donor has been made a partner in the process of fund raising, he or she begins to enlist more people in the support of LKS.

SUSTAINING THE DONOR

We keep in touch with our donors on a regular basis, on average 18 times a year. How do we accomplish this? First we send him or her the direct mailer. When we receive the contribution, we send a receipt. Then we reach him or her 12 times a year through our newsletter and then also through our various cards for holidays like Diwali, Holi, New Year, and Independence Day. Thus, we are in constant touch with our donors; and do not give them a chance to forget us.

The average expenses for each person is only Rs. 38 inclusive of printing and postage, whereas our average rate of return per person is as high as Rs. 300. Because we firmly believe in the slogan "out of sight, out of mind," we want LKS to be in focus at all times in the eyes of our donors as well as beneficiaries.

4

The Importance of Government Commitment in Developing a Sustainable National Program

Dr. Francisco Contreras

The National Health System in Peru has created six specialized institutes, including National Institutes of mental diseases, neurology, children's diseases, cancer, rehabilitation, and ophthalmology.

Therefore, diseases and disorders of the eye constitute a significant priority of the government. The National Eye Institute of Peru is situated in the poor section of Lima. The Institute has 60 beds, four operating rooms, one Experimental Surgical Unit, an Ocular Pathology Laboratory, an Ocular Microbiology Laboratory, an Eye Bank and the usual specialized clinics. There are 22 ophthalmologists and 24 medical residents in the three-year postgraduate program, half of whom are from foreign countries.

Each day the Institute conducts about 300 consultations and perform 30 eye surgical procedures. The annual budget for the Institute, which is provided by the National Government is about $200,000. An additional equal amount of money comes from patient revenues and also from the contributions of non-governmental organizations for specific projects.

Besides the clinical and surgical activities that I have already mentioned, we have a Department of Education of Medical and Para-medical personnel. The Department of Clinical Research and Publications produce a specialized biannual journal and two bulletins, one for ophthalmologists and the other for the ocular health community. The Department of Community Services includes assistance to slum areas, orphanages, asylums, jails, and remote areas of Peru.

Peru has a National Prevention of Blindness Committee, consisting of delegates from the Ministries of Health, Education, Labor and from other local, national, and international non-governmental

organizations such as, OPELUCE, CERCIL, Rotary, Lions, Helen Keller International, Operation Eyesight Universal, and Project Orbis. This Committee is mainly dedicated to coordinations of prevention of blindness activities.

The Peruvian National Eye Institute is giving special attention to the integration of the Eye Program activities with those of the National Health Program. We are already initiating this activity in selected regions of my country.

The challenge is huge, but we have the cooperation of the National Government, the prevention of blindness community, and those in the ophthalmic professions, particularly young ophthalmologists.

5

Why Governments Commit Themselves to Starting an Eye-Care or Prevention of Blindness Program

Dr. Füsun Sayek

There are several reasons why government leaders start programs to treat or prevent blinding eye diseases.

When morbidity and mortality related to eye diseases are high in a particular country, government decision-makers often commit the nation to finding ways of reducing them. Sixty years ago the newly founded government of Turkey decided to start a trachoma-control program to reduce the extremely high prevalence of blinding trachoma in the country. This vertical program has achieved its goal. Trachoma cases have been reduced dramatically in a short period, but this successful program has never become a national eye-care program or been integrated into the country's health-care system.

Decision-makers may recognize that the eye-care services are not well organized. Overcrowded outpatient departments, a high complaint rate from ophthalmologists, and continual public criticism are all strong motives for government action.

Political leaders and administrators can be inspired by international organizations, particularly NGOs. These organizations can create incentives at different levels.

Finally, inspiration may come from an enthusiast to whom the government responds.

All or some of these four incentives may occur simultaneously, but just one of them can be enough motivation to start an eye-care program. In Turkey all happened at virtually the same time.

After a government has committed itself to founding such a program, the question to be answered is: *How* should an eye-care program be started?

In Turkey the Ministry of Health was the ideal government office

to begin such a program, because it is responsible for planning and implementing health policy and is the main health-care provider.

However, if an action-oriented program would be more suitable than a unit-oriented program, an existing administrative structure to coordinate the activities can be used. We decided to use the trachoma unit as our secretariat, and the Higher Council of Health, an advisory body to the minister, was supplemented with a special eye section to act as a temporary National Eye-Care Committee. The composition of this committee was not ideal, but it was hoped that subcommittees would be formed when necessary to increase its success.

Some obstacles and solutions regarding the founding of an eye-care program are as follows:

Often the leadership and even unit coordinators may be located at a distance from the program's activities. In addition, because in many countries health, curative, and preventive service teams are organized within different departments, the cooperation between these departments can be inadequate. To avoid friction between preventive, curative, and rehabilitative programs, the coordinator was placed in the General Directorate of Curative Care, whereas the secretariat was in the General Directorate of Primary Health Care. Our experience has shown that this has facilitated interpersonal and interdepartmental interactions and has resulted in improved coordination.

However, if a committed chairperson is not present, the best intentions of the government will not be sufficient. The chairman should be an ophthalmologist, ideally one with special training in public health. The coordinator's enthusiasm, ability as an administrator, and knowledge of the country's health sector are vital for a successful start. The chairman should be a full-time member of the Ministry of Health, but should be able and willing to take on additional responsibilities. Although this may reduce the time they can devote to the eye-care program, it also will keep them informed about other health-care programs and may facilitate the integration of beneficial eye-care activities into other programs.

There are two additional, very sensitive points here. The first is that the coordinator should be able to exercise power without becoming bogged down in bureaucratic details. The second point is that they should not forget that the first priority is to run an excellent eye-care program. To be overly conscientious of other administrative priorities within the Ministry might hinder eye-care

activities. However, this should not prevent them from trying to integrate eye-care activities into the government's other priority programs. The coordinator also should be strong enough to handle the criticism of ophthalmic colleagues concerning any perceived delays in the eye-care program as well as possible criticism from other health-program managers concerning perceived fanaticism in the furthering of eye-care programs.

Political instability in the Ministry may be a difficult problem to overcome. Frequent changes among the decision-makers within the Ministry of Health can delay the implementation of any effective program. Ophthalmologists may find themselves again and again trying to convince new bosses about the virtues of eye-care programs.

Successes and failures of the Ministry in general do affect the eye-care program. The competition of many Ministry activities for resources is perhaps the best example of this. Some suggestions for an ophthalmologist to overcome such a situation: be patient; try to accumulate managerial authority, yet be sure to retain your ophthalmic skill (try to achieve a balance between being a soldier/technician and a general/policy maker); make every effort to win supporters for your program; do not lose your connections outside of the Ministry—warm relations with the ophthalmic community and academicians are especially important; and continually train successors.

6

WHO Technical Cooperation for a National Program for the Prevention of Blindness

Dr. A.D. Negrel

The WHO Program for the Prevention of Blindness (WHO/PBL) was established in 1978 through the implementation of a number of World Health Assembly resolutions: resolution 22.29 in 1969, resolution 25.55 in 1972, and resolution 28.54 in 1975. These resolutions requested that the Director-General promote national programs for the prevention of blindness with special emphasis on those caused by trachoma, onchocerciasis, xerophthalmia, cataract, glaucoma, and trauma; and to encourage the mobilization of necessary resources. As in other fields, the role of WHO must be that of promoter/catalyst; the final responsibility for implementation of effective programs rests with national health authorities.

The essential components of PBL and its possible technical cooperation with Member States are based on a multidisciplinary approach and include activities such as: methodology assistance in the assessment of blindness and its causes; technical advice and support for the formulation of national plans; training auxiliary personnel in eye care and consultations on the monitoring and evaluation of the methodology of health programs; applied research within national programs for effective service delivery; assistance in the identification of potential resources for national programs; and making available updated and comprehensive documentation on technical aspects of blindness prevention.

For the purposes of this paper the WHO technical cooperation will be presented at three levels: 1) the country level (when requested); 2) the regional level (according to the WHO definition of a region); and 3) the global level.

THE COUNTRY LEVEL

As blindness prevention activities are carried out and gradually expand to a national scale, overall coordination becomes necessary for planning and evaluation. The formulation of a national program for the prevention of blindness demands the assessment of overall needs and resources and requires input from the many sectors that could contribute to blindness prevention. Such a program should be based on a primary health-care approach and include both the control of specific blinding diseases and the provision of essential eye care to all.

At this level the WHO/PBL collaborates with its member states in the following main fields:

1. Assessing common blinding disorders. PBL has developed a simplified methodology for field surveys on blindness and its causes. The objectives and principles for this methodology are:
   - Providing epidemiologically sound data on the prevalence of blindness and low vision;
   - Allowing an assessment of the main causes of visual loss and their relative importance;
   - Providing pertinent yet selected information on specific ocular morbidity, treatment for eye diseases, and current needs for action in terms of eye care;
   - Using low-cost examination technique (with most of the field work being undertaken by trained auxiliary health personnel);
   - Allowing a rapid assessment of the ocular status in defined populations.
2. Planning local intervention schemes and formulating targeted national blindness programs geared to identify local needs within the framework of primary health care.
3. Providing technical guidelines and expertise for monitoring and evaluating control measures and program activities.

   One important aspect of developing a national blindness prevention program is the inclusion of an evaluation component. To achieve this, PBL has developed simple models for evaluation that focus mainly on changes in prevalence/incidence or in the intensity of eye disease. This is a suitable short-term approach.

4. Training personnel, particularly at the primary and first referral (district) levels through the provision of simple eye care and the promotion of eye health.

Another cornerstone for the WHO/PBL is the support given to:

1. Training manpower through fellowships or grants;
2. Developing training material in eye care and for public information on eye health;
3. Developing refresher courses and continuing-education systems for appropriate personnel;
4. Establishing national workshops; and
5. Strengthening selected teaching institutions to promote training in the public health aspects of ophthalmology and to serve as national/regional centers.

   Some WHO Collaborating Centers for the Prevention of Blindness train personnel at various levels. Of particular interest are regular courses in community eye health, particularly in prevention and epidemiological ophthalmology.

   The following institutions, according to the global prevention of blindness strategy, try to prepare their students for new professional roles and to provide skills for efficient project management: the International Centre for Eye Health (ICEH), London, United Kingdom; the International Center for Epidemiologic and Preventive Ophthalmology (ICEPO), Johns Hopkins School of Hygiene and Public Health, Baltimore, Maryland, USA; and Institut d'Ophtalmologie tropicale de l'Afrique (IOTA), Bamako, Mali. The programs presented by these institutions are suitable for ophthalmologists or others interested in blindness prevention activities, including the managerial and research aspects of such programs.
6. Strengthening of appropriate infrastructure for eye care, particularly at the district level (including the transfer of relevant technology).
7. Supporting operational and health-systems research to generate, improve, and apply optimal technology and management in the control of blinding disorders

   The WHO/PBL also has a research component that mainly provides modest seed money to applied research

projects. [See the Report of a task force on evaluation mechanisms for programs for the prevention of blindness, Geneva, WHO, 1984, p. 15. (WHO/PBL/84.9) unpublished.]

The activities in this field focus mainly on: planning and coordinating research relating to blindness prevention and applicable technology, for example the provision of spectacles at low cost, and supporting epidemiological and health-systems research in identified priority areas as part of national program development. Such activities are usually carried out by a research module within PBL or one or more of the WHO Collaborating Centers for the Prevention of Blindness, 14 of which have now been designated around the world.

8. Offering assistance upon request to national programs for the mobilization of external resources required for organization or for specific aspects of prevention.

THE REGIONAL LEVEL

At this level, WHO/PBL assists in collecting, updating, and disseminating information concerning blindness prevention. Support is given to training the middle-level and supervisory categories of health workers on an inter-country basis in seminars and workshops.

PBL also provides technical expertise for regional program development in fields such as technology application and operations research. PBL also reinforces what is done at the country level.

THE GLOBAL LEVEL

PBL maintains a data bank on blindness and collects information on trends in the pattern of blinding diseases. Strategies for the early detection and management of blinding disorders are developed through a global consultation process that includes leading experts and institutions. The outcome of this work is available as specific reports on meetings or as technical documents and publications issued by WHO.

Training aides in eye care and educational material for generating public awareness are developed and adapted to regional conditions. Regular interregional or global meetings are held, usually at yearly intervals, to allow proper coordination of program development.

Operational research and new aspects of available technology are supported through the network of collaborating centers already mentioned above or through other selected institutions.

AT ALL LEVELS

Close collaboration is maintained with international nongovernmental organizations (NGOs) and United Nations agencies working in the field of blindness prevention, eye care, and rehabilitation.

One of the strategies of the WHO/PBL is its strong collaboration with NGOs. Some of these organizations were operational before PBL was established and were responsible for its inception. The International Agency for the Prevention of Blindness was especially instrumental in its founding.

Another strategy is to have regular consultations between the WHO/PBL and the leading NGOs to facilitate coordination of work and joint program development.

In conclusion, the development of national programs for the prevention of blindness has been one of the most successful activities of the WHO/PBL and has led to its collaboration with a network of international NGOs. Over the last 12 years, 66 member states have collaborated with the WHO in the preliminary assessment of blindness and its causes, the preparation and formulation of national plans of action, or in the implementation and evaluation of their ongoing programs. Several more countries are due to follow in the near future.

In the frame of its mandate and from its inception, WHO/PBL has always tried to discover, in accordance with the interested Member States, the most practical solutions to overcome constraints encountered. Some of these obstacles are relatively easy to overcome when financial resources become available. Unfortunately, others remain great challenges, particularly when changes in lifestyle, project management, or professional roles are required.

Indeed in this context the further prospect of world blindness prevention will depend largely, but not exclusively, upon the availability and sustainability of resources. This is why the political and professional commitment to blindness prevention of both developed and developing countries needs to be reinforced around the world.

7

The Role of the Network of Non-Governmental Organizations in Starting and Developing Sustainable National Programs

Mr. Kevin Carey

Given the diversity of the international non-governmental organizations (NGOs) concerned with eye care in developing countries, it is a tribute to them that there is an effective network. The success of that network has improved the individual and collective performance of the international NGOs particularly during the past 10 years. International eye care NGOs are voluntary nonprofit organizations based in industrialized countries which work with eye-care planners and providers in developing countries to improve services and provide technical cooperation and/or program finance. Personally I find the term NGO divisive; it separates us from governments in a way which is symbolically powerful. When you consider that the government eye-care budgets of most developing countries are less than the total contribution of the network, the term is even more inappropriate.

Whatever their different backgrounds, all of the eye-care NGOs are interested in planned and sustained growth, the delivery of eye-care services, and that they provide a high level of professional skill.

There are approximately 20 international NGOs that can be classified as part of the network. They may specialize in dealing with governments and national NGOs of and for the blind (Sight Savers); work with Christian missions (Christoffel-Blindenmission); or work with both (Operation Eyesight Universal). They may specialize in technical cooperation (Helen Keller International). Some are particularly good at primary eye care (International Eye Foundation), and others tend to work in linguistic areas (Organisation pour la Prevention de la Cécité and ONCE). Some confine their

activities to eye care whereas others also work with incurably blind people dealing with such matters as special education and rehabilitation. The important point is that the NGOs complement each other.

The central idea of the network is to combine the strengths of the different international NGOs in the network when looking at a country's or a region's eye-care needs. Say, for instance, it would be best to combine Helen Keller International's technical skills in planning with the International Eye Foundation's primary health expertise, or Sight Savers' secondary level expertise and Christoffel-Blindenmission's expertise on the ground in the country concerned. The aim of the network is to carry out these activities through national prevention of blindness committees under the umbrella of the IAPB. The network also provides a means for strategic planning between international NGOs at the policy-making and strategic planning levels.

The least formal and most comprehensive manifestation of the network is the Partnership Committee which is open to all the eye-care international NGOs plus other international NGOs that specialize in services in developing countries for incurably blind people. The Committee is governed by a broad-based Memorandum of Understanding. It generally meets twice a year, once specializing in eye care and once in education and rehabilitation. It nominates the 10 Group E members of the IAPB Consultative Board which in turn become the Consultative Group.

The Consultative Group lies somewhere in formality between the Partnership Committee and the Program Advisory Group (PAG). It meets every two years, alternating with the Program Advisory Group and, as a body linked to the WHO, its proceedings are necessarily formal.

The Program Advisory Group, which meets every two years, brings together representatives from all WHO regions; the professional staff of the Prevention of Blindness Program in Geneva; and the Consultative Group of international NGOs as observers. This provides the opportunity for a detailed program review and the formulation of recommendations, taking into account perceived needs and the capacity of the entire eye-care system to meet them.

The IAPB General Assembly draws all these strands together for a periodic general assessment that combines the whole network with key eye-care people from all developing countries. The network of international NGOs is represented on the IAPB Executive Board by 10 international NGOs that are nominated by the Part-

nership Committee; these in turn become the Consultative Group and the observers at the Program Advisory Group; thus the whole system is inter-locking.

In the fields of work with incurably blind people there is not an equivalent density of structure. The Partnership Committee discusses problems of mutual interest and its natural recourse is to the General Assemblies of the International Council for the Education of the Visually Handicapped and the World Blind Union.

Indeed, one of the challenges facing the international NGO network in the 1990s is to build a consultative structure for education and rehabilitation along the lines of the consultative structure in place to deal with eye-care matters.

How can national eye-care planners take advantage of the network? First, in most countries there is at least one international NGO operating and, in countries where there is more than one, one will have been designated as the "lead agency" to ensure that efforts are not duplicated. This means that you can use one international NGO as the root for requests for assistance to all the rest of the network. This only works, of course, if both international NGOs and planners stick to the rules. The problem here is that there is always a shortage of good eye-care programs and international NGOs, which rely on good programs to raise funds, are tempted to compete rather than collaborate. This situation would be greatly improved if the amount of good programming increased so that there was a better balance between programming and funding. I am often told that certain targets in eye care cannot be achieved because of a lack of resources; usually it is a lack of planning and follow-through. I have never yet seen a good eye-care project shelved for lack of funding.

In conclusion, let me say a few words about the future of the network. First of all, I think it is time to play down the distinction between the government and the non-government sectors; in the next decade the private sector will grow stronger as the public sector grows weaker. Secondly, the concept of networking will gain strength as hierarchical models of organization are seen to be less productive. Finally, de-regulation of all sorts will inevitably lead to increased competition and the social challenge of the decade will be to distinguish between those areas where competition is appropriate and those where the appropriate vehicle for providing a service is collaboration.

As far as I know, there is not a group of diseases better served

in developing countries than blindness: the commitment of governments in terms of policy formulation and planning and service delivery during the last decade has been truly remarkable; the national NGOs of and for the blind have undertaken rapid expansion based on greatly increased professionalism; and these efforts are complemented by a network of international NGOs that have a good track record, a variety of approaches, the ability to raise funds, and a willingness to work with each other and with those who can benefit from what we know and what we have. For macroeconomic and geopolitical reasons outside our control we are entering the age of the NGO. I wonder whether we are properly prepared?

8

Current Activities of Non-Governmental Organizations in Prevention of Blindness and Eye-Care Programs

Dr. A. Hardenberg

INTRODUCTION

We have already heard a brief history of the various major non-governmental organizations (NGOs) and also a description of the structure within which exist the coordination and collaboration of the activities of the NGOs. I would now like to turn our attention to the present-day activities of the various organizations in different parts of the world. The NGOs work together in more than 100 countries around the world and in well over 1,200 individual programs with a total eye-care budget of approximately $40 million per year.

LATIN AMERICA

In Latin America and the Caribbean the NGOs support programs in more than 20 countries with particular emphasis on the development of cataract surgical programs in rural areas. It is estimated that in South America there are between 1.0 and 1.5 million blind people with another 500,000 to 800,000 blind in Central America and the Caribbean. Cataract is probably responsible for at least 50 percent of blindness in Latin America. In most countries of the region there are sufficient numbers of ophthalmologists in the large cities, but the provision of specialist services in rural areas is very limited. Various strategies have therefore been developed to provide cataract surgical services to poor people living in rural areas. Cataract-Free Zones have been evaluated in Brazil and Peru and are now being further developed in other countries of the region. In city slum areas satellite eye clinics, staffed on a part-time basis by ophthalmologists, have been started in some countries to provide

inexpensive eye-care services with a referral system to hospital facilities in the major cities for those patients requiring eye surgery.

Onchocerciasis remains a problem in a few isolated places in certain Latin American countries and the NGOs are now involved in providing resources for Ivermectin distribution programs. Vitamin A deficiency leading to childhood blindness from xerophthalmia remains a problem in certain areas of the region and the development of model programs to increase vitamin A nutriture are being developed. For the immediate future the NGO community is interested in supporting the development of national prevention of blindness programs, particularly in the poorer countries of Latin America in order to provide eye-care services to poor people in rural areas and urban slum situations.

AFRICA

In Africa the NGOs work in more than 40 countries with some organizations focusing their activities in Francophone countries. Vertical programs have been supported for the control of onchocerciasis through Ivermectin distribution and the prevention of xerophthalmia through improved vitamin A nutriture. In general, however, the emphasis in Africa has been on the development of training programs, particularly for ophthalmic assistants and ophthalmic nurses to provide comprehensive eye-care services at the district-hospital level in the context of a National Prevention of Blindness program. The NGOs were instrumental in starting the first training programs in East Africa in the 1970s and more recently in supporting the establishment of training programs in West Africa.

Many countries in the Africa region have active prevention of blindness committees, and various NGOs attend their meetings as members and advisors. The organizations have been involved in trying to integrate voluntary and church medical services into national planning and programming for prevention of blindness, catalyzing the coordination of public and private-sector eye-care services.

Besides the lack of trained manpower in Africa, there also exists a great need for development of appropriate inexpensive and low-maintenance technology to provide materials and medicines necessary for eye-care services. With this need in mind, the concepts of low-cost spectacle production in optical workshops and

local production of eye drops in hospital pharmacies have been developed and promoted by the NGOs throughout the African Region.

ASIA

In Asia we have been particularly involved in the problem of cataract blindness, in many countries but most notably India, as well as assisting in the development of programs to combat vitamin A deficiency in children. The development of the prevention of blindness program in Nepal over the last 10 years and the organization of different NGOs to be responsible for eye-care services in the various districts of Nepal with coordination from the national committee is an excellent model for how national governments and different NGOs can work together to develop a cost-effective prevention of blindness program. Several NGOs have now started projects in China and in countries of South-East Asia.

CONCLUSION

On a more general level, the NGOs have supported various interregional and regional workshops on childhood blindness, manpower development for Africa, and the local production of eye drops. Next year a workshop will be supported on the theme of Ivermectin distribution. All the NGOs consider training of eye personnel a high priority in their programs. WHO will help develop and support the production of educational materials and give sponsorship for training programs particularly in community eye health.

In conclusion, there is no doubt that the last decade has brought a much greater understanding on the part of NGOs of how to initiate, develop, and coordinate eye-care programs in different parts of the world. Mistakes have been made, often through inadequate preliminary assessment of the problem, poor communication between various involved parties, and naivety in terms of the long-term consequences of what initially seems like a good idea. The fact that people mean well and work hard does not necessarily mean that the result will be good. Individually and collectively the NGO community has learned (and is still in the process of learning) the lessons of long-term planning with ministries of health and local

voluntary organizations to develop sustainable eye-care services in order to reduce the number of blind men, women, and children in the world.

9

The Role of Non-Governmental Organizations in the Development of a Sustainable National Program

Mr. John M. Palmer, III

Familiar themes of this plenary session concern international non-governmental organizations (NGOs) and how we should work as a group to initiate, develop, and support sustainable prevention of blindness activities and improve our collaboration during the 1990s.

David Korten, an acknowledged commentator on international development, has categorized agencies such as Sight Savers, Christoffel-Blindenmission (CBM), Helen Keller International (HKI), the International Eye Foundation (IEF), Organisation pour la Prévention de la Cécité (OPC), and Operation Eyesight Universal (OEU) into three classifications:

First-generation organizations, known as relief and welfare agencies, involve private voluntary organizations (PVOs) that directly deliver services to meet immediate human needs. Second-generation organizations seek to strengthen self-reliance in selected localities through community-development interventions. Third-generation PVOs are directed toward achieving sustainable changes in resource management systems to improve the generated flow of benefits.

The agencies represented at this Fourth General Assembly certainly represent each of these categories. Most of you know who we are and how we work. I think it might be informative for us to hear about how you perceive each of our agencies and the model it fits. Multiple models might be pertinent in the case of some projects. Whether we meet your immediate and long-term needs also would be useful information. For example, we think that HKI's mission is explicitly aimed at third-generation approaches to the integration of eye health, prevention, treatment services, and rehabilitation of the blind. In addition, we certainly perform first-generation activities in meeting immediate human needs, and also support self

reliance through the second-generation strategy of institution building, manpower development, and community-based programs.

Under the third-generation system of influencing eye-care delivery, goals and objectives are reached through the establishment of pilot programs, evaluation, expansion, replication, and nationwide policy adoption and integration. Benefits from model programs in one region are tested, evaluated, and adapted nationwide.

Not all NGOs work identically. Looking toward the 1990s, however, I think that there are at least four characteristics that should shape our approaches to blindness prevention:

1. *Research:* As needed, we should conduct baseline studies on the prevalence of eye-health problems and then use the resulting data to demonstrate the need for prevention and treatment in national policy. We then need to match this with a definition and catalogue the capacity of existing health systems and the accessibility of existing services.
2. *Training:* Training in planning and management of primary eye care as part of the primary health-care system is critical to a successful program and should be undertaken with local counterparts. HKI normally works under Ministry of Health auspices. We jointly analyze and plan as part of the process of evaluation. Data management, analysis, and performance review based on pilot programs should be integrated as regular parts of program administration.
3. *Appropriate Technology Transfer:* Most of our organizations advocate the transfer of appropriate health technology such as eye charts, simple eye loupes (instead of operating microscopes and more costly items), and cryo-extractors (instead of costly irrigating and aspirating devices).
4. *Cost-Effectiveness:* We must continue to conduct cost analyses and organization analyses that justify the cost of providing eye health in terms of benefit to society. The economic contribution of a rehabilitated blind person or the income gained through the improved health of individuals is stressed. This documentation will assure economic justification for national policy makers that eye health should be a priority among all their pressing needs. We should not neglect, however, the humane importance of preventing blindness irrespective of the economic return.

Most of us have been engaged in the global effort to prevent blindness for decades. Cynics might ask: "If you're so good at what you do, why is blindness increasing at such an alarming rate?" Perhaps as we face the nineties, we should learn from the lessons of history:

Careful planning is necessary if we are to have a positive influence on national health-care policy. The following factors impact on program sustainability and the prospects for expansion.

1. National interest in model eye-care programs must be considered. Government interest can be influenced by awareness of blindness prevention programs and this awareness can change the priority given them.
2. A government's capacity to sustain and replicate programs is influenced by the availability of human, financial, and organizational resources.
3. Program readiness for replication is influenced positively by demonstrated program effectiveness and the transferability of systems. Conversely, it is influenced negatively by the use of unique resources not readily available. Is the program likely to run down after initial enthusiasm disappears?
4. Initial replication success is imperative to overcome the difficulties that can be encountered in the initial expansion of a program.

Finally, we have found that often the success of a program can be traced to the timely selection of a host country familiar with public health policy, committed to eye care, and courageous enough to take on the Ministry of Health priorities.

And so what of the nineties? One of the great challenges facing NGOs in the coming decade is to sustain the substantial growth in funding and program outreach we experienced in the 1980s.

For example, in 1980 HKI supported six country programs with a budget hovering around $1 million. In the past 10 years, our programs have increased over sixfold to include 38 country programs in 1990. Similarly, our budget has multiplied eightfold since 1980. As Kevin Carey noted, other NGOs have also experienced major expansion. Continuing that rate of growth in the current economic environment will be difficult.

The opportunities we have discussed this week summon us to intensify our fund-raising efforts in order to exceed our past per-

formance. However, the global climate at the outset of the nineties indicates that it will be something of an accomplishment for us to simply sustain the level of support we achieved in the proceeding decade.

Another challenge facing our International Partnership of PVOs dedicated to blindness prevention is to do for ourselves what we ask of our national counterparts: just as we advocate the need for the articulation of national strategies for blindness prevention, so we need to give the form and substance of a global strategy for blindness prevention in which each of our agencies assumes a role. We should collectively agree on a global plan for the decade of the nineties, identify the appropriate roles for each member agency, and then implement a coherent and concerted action to accomplish our goals and objectives for the next 10 years. We cannot afford the outrages of parochialism, competitiveness, redundancy, or the sheer waste of effort caused by poor cooperation, inadequate planning, or isolated and unrelated program activities. These impediments too often retard our current performance.

However, there are encouraging signs. Not long ago, at a meeting of the Partnership in Kingston, Jamaica, representatives of our agencies agreed to meet this spring in Geneva under the aegis of the WHO to map out a unified inter-agency agenda for the distribution of Ivermectin and the eventual eradication of onchocerciasis. Each agency in the Partnership will accept a role and the community of NGOs will move as one body in an effort to successfully control river blindness. Another more modest example will occur in Haiti, where members of the Partnership working there have agreed to assist the Haitian Blindness Prevention Committee in the development of a national program for blindness prevention. Members of the Partnership will then assume responsibility for supporting the national program by taking specific roles in a mutual strategy.

This Partnership of international non-governmental organizations is truly an interdependent community. Each of us, by Korten's definition, exhibits a unique operating style and philosophy and we are enriched by our diversity. The world will be improved, however, not by the brilliance of our differences but by the effective integration of our strengths as we work in concert to save sight and save lives.

10

The Role of an African National NGO in the Development of a Sustainable National Program

Mr. Michael A. Dunsford

INTRODUCTION

The Kenya Society for the Blind was established by an Act of Parliament in 1956. Previously, it had been an extension of the British Empire Society for the Blind, later the Royal Commonwealth Society for the Blind or Sight Savers. When Parliament established the Kenya Society for the Blind, it made it clear that the Society was expected to fulfill both medical and social roles, or as the legislators put it, "to do all things appertaining to blindness."

Thirty-four years later, we are delighted as a Society to record significant successes in the medical, educational, and rehabilitation fields. This paper seeks to highlight the major developments of the Kenya Society for the Blind in blindness prevention and the education and rehabilitation of the visually handicapped and to discuss the Society's perceived role in the 1990s and beyond.

EYE CARE

From the outset the Kenya Society for the Blind performed the role of a bridge between the Ministry of Health and international agencies. In 1957, just a few months after its establishment, the Society persuaded the Ministry of Health to join it and the Royal Commonwealth Society for the Blind to carry out the first blindness survey in Kenya. The result of this survey was that from then henceforth the Society acted as a link between the Ministry and other national and international NGOs participating in the Kenya Ophthalmic Program.

The foundations of the Kenya Ophthalmic Program can be traced to this 1957 ocular-status survey which indicated that the main causes of blindness in Kenya were preventable: cataract, trachoma, glaucoma, and a host of minor conditions, including xerophthalmia, injuries, and measles. The survey also indicated that the bulk of these eye problems were to be found in rural areas. These two conclusions formed the basis of priorities which led to the development of the Kenya Ophthalmic Program. First, it was realized that there would not be enough eye surgeons for the country immediately and therefore, it was decided that ophthalmic paramedical must be trained and deployed in rural areas. The first such ophthalmic clinical officer was trained in 1959 and in 1960 was deployed to render ophthalmic services using a motorcycle. His training was a joint effort of the Ministry of Health, the Royal Commonwealth Society for the Blind, and the Kenya Society for the Blind and marked a further strengthening of the partnership that had begun in 1957 and which has persisted to this day.

The first mobile eye unit, conducted on a motorcycle was launched as we have indicated in 1960 under the following arrangement:

1. The Ministry provided the medical personnel and the base for the Mobile Unit;
2. The Royal Commonwealth Society for the Blind provided the motorcycle and funding for its maintenance;
3. The Kenya Society for the Blind provided management and supervision of the eye unit and handled reports to both the Ministry of Health and the Royal Commonwealth Society for the Blind. Later, this arrangement expanded to include not only these three parties, but also other organizations such as AMREF, Operation Eyesight Universal (Canada), Prof. Weve Foundation (The Netherlands), the International Eye Foundation (USA), and Sight by Wings and Lions Clubs.

As the family grew, so did the need for coordination. This led to the formation of the Prevention of Blindness Committee in 1966 with the Kenya Society for the Blind being given the role of coordinator and later its secretariat. Side by side with these developments, was the steady expansion of mobile units which by 1963 had shifted

from motorcycles to Land Rovers and which were rapidly growing in numbers as more organizations provided funding for them. This development demanded more ophthalmic clinical officers and hence the need for a local training program for them. By 1982, it was clear that the Society had to assume heavier management responsibilities for the 14 mobile eye units as well as a large number of Ministry of Health personnel involved in this program. It therefore became necessary to actively seek to strengthen the Prevention of Blindness Committee; this was achieved in early 1983.

The Society has maintained its role as a link between the Ministry of Health and the NGOs up to the present time and will continue to do so in the future. In addition to acting as a bridge, the Society also provides active leadership and fund-raising to the Ophthalmic Program which in turn gives it the flexibility to expand horizontally and vertically.

Over the next five years, the Society plans to assist the Ministry to establish eye departments in provincial and major district hospitals. This commitment places a heavy fund-raising responsibility on us, a challenge we shall take up to ensure that appropriate facilities are availed to the citizens of Kenya. Blindness prevention and cure represents about 50 percent of our efforts currently. This underscores the importance we attach to the need to prevent preventable blindness and to cure curable blindness because if this can be achieved, less resources will be needed for education and rehabilitation of the blind.

EDUCATION AND REHABILITATION

The Society has always been aware that visually handicapped persons require special equipment and has adapted methods of teaching and training. For this reason, the Society is engaged in a vigorous education and rehabilitation program in partnership with international NGOs and the ministries concerned.

It supports educational programs with special equipment and other technical support services. Our involvement in this field has enabled the Ministry of Education to set up an integrated program which enables blind persons to learn in the same classroom with their sighted counterparts.

The Society is currently engaged in training blind persons to become self-employed through farming, baking, carpentry, joinery,

tanning and leather work, knitting, and tailoring especially for partially sighted persons. Those who wish to become farmers but have no land of their own get assistance from the Society to acquire land. Over the last two years, the Society and its partners have purchased small holdings for 11 families.

A program assists potential blind businessmen to set up their own businesses. Not all blind persons can become farmers or businessmen, therefore a program has been set up that is aimed at establishing income-generating projects that are run on commercial lines and which in turn provide formal or industrial employment to skilled blind persons. The first of these projects, a bakery for the blind, has just opened and is yielding encouraging results. Eight blind persons and five sighted ones have found salaried employment in this project. We are committed to develop more income-generating projects in all areas of industry where blind persons can perform efficiently.

THE KENYA SOCIETY FOR THE BLIND TODAY

At present, our 19 mobile eye units examine and treat over 250,000 patients annually, which represents about half of the total patients reached by the entire program. The 20th mobile eye unit is the only mobile teaching program which on average annually gives one-day seminars in basic eye care to some 2,000 schoolteachers, general health workers, and community leaders through whom we hope to pass primary eye-care messages to the community level. In addition, the Society through assistance from its partners and the Ministry of Health currently provides management to the first National Eye Drops Production Unit situated at the Society offices. When fully operational, this Unit will produce a dozen or so basic eye drops needed by the Kenya Ophthalmic Program. We are currently building a new eye department in a provincial hospital and planning to expand the teaching facilities for ophthalmic surgeons at Kenyatta National Hospital early in 1991. Overall, we hope to complete four new eye departments and to renovate or extend 13 eye clinics in government hospitals by 1995. Our Eye Health Information Unit is in the process of being computerized and should within the next year or so be capable not only of receiving eye-care data but also of analyzing them for purposes of continuing policy formulation and implementing and evaluating the program. In 1989,

the unit received data from 36 out of 46 government eye departments and in 1990 the unit expects to receive data from all of the 46 government eye clinics as well as from church missions and NGO programs.

In the field of education and rehabilitation, the Society is currently pursuing a program of assisting all parties concerned to develop strategies aimed at integrating blind persons both at school and at work. The Society is developing pilot projects to serve as examples of what blind people can do. Since 1986, the Society has trained over 40 farmers who on the whole, are presently self-sufficient in their daily needs. The Society is currently able to train only 12 farmers a year, but we hope to expand this significantly by 1995.

The Society has also assisted some 20 small scale businessmen through loans and other support. The experience has led to the development of a new approach to this program which entails a three month formal training in basic business skills of all clients prior to commencement of their businesses. This new program will be launched in 1991. Our bakery at Embu is the first commercial Bakery for the Blind which emphasizes the Society's desire not only to find new jobs for blind Kenyan's but also to participate in the economic development of this country. The bakery has not just created jobs for eight blind and five sighted persons, it is also fulfilling a local need for bread. And, of course, it has exposed us to the exciting business of commercial competition. This year, the Society participated in two exhibitions and one show at which items made by skilled blind men and women were displayed and sold. From the public response, I am convinced that blind persons should be given every opportunity to participate in crafts, industry, agriculture and commerce. We in the Society are committed to the development of pioneer programs in these fields.

CONCLUSION

In concluding my discussion, let me note that the Kenya Society for the Blind is the principal national organization for the blind in Kenya. Its role in the provision of services to the blind include:

1. Providing leadership and advocacy;
2. Coordinating local and international fund raising;

3. Collecting data on programs for the blind and blindness prevention;
4. Registration of blind persons;
5. Promotion of general welfare for the blind;
6. Creation of public awareness about blind persons and programs designed to prevent or cure blindness or otherwise improve the lives of blind persons through education, training, and rehabilitation;
7. Advising the government and other organizations or persons on all matters affecting the blind.

11

The Role of an Asian National NGO in the Development of a Sustainable National Program

Mr. K.S. Gupta

THE ORGANIZATION

Essential Characteristics of a Model Self-Sustaining Program for the Prevention of Blindness: Lok Kalyan Samiti

Lok Kalyan Samiti (LKS) or People's Welfare Organization is a voluntary, nonpolitical, nonprofit health and family welfare organization which was started in New Delhi, India, in 1952 with the primary objective of providing medical relief for the poor.

SOLVING THE PROBLEM OF CATARACT

Poverty and ignorance directly contribute to the increasing number of health-related problems in India. Blindness is a major problem which of late has gained some attention from Indian authorities due to the shocking increase in the numbers afflicted. Cataract, glaucoma, nutritional deficiencies, and refractive errors are the major causes of these cases of blindness. Cataract, by far the most common cause, is a disorder that clouds the lens of the eye, thereby obstructing the passage of light and gradually leading to blindness. Through cataract surgery, the cataractous lens is removed and vision is restored. LKS performs cataract eye operations by organizing eye camps from our hospital base. Since the inception of this program in 1976 we have restored eyesight to more than 17,000 people. These individuals have been able to return to the mainstream of society and are now able to lead useful and dignified lives.

HOW LKS OPERATES

LKS operates through eye camps, which in India have an extensive history of trial and error. In light of this vast experience, we have come to the conclusion that the best results of eye surgery can be obtained by adopting the following procedures.

1. Bring the patient to a hospital complex.
2. Operate in a well-equipped operating theater and use experienced eye surgeons.
3. Keep the patient in the hospital for a few days.
4. Follow up with a mobile unit at a location near the patient's home.

We organized our first eye camp in 1976 in a village called Badarpur, situated just outside Delhi. The manual work we needed to accomplish in leveling, cleaning, sweeping, and disinfecting the ground over which we put up Shamiyanas (tents) was stupendous. How hard and demanding it was can well be gauged by the fact that even the drinking water had to be transported from Delhi. That year we conducted two eye camps in different locations that accounted for 212 eye operations. The exercise continued in this fashion for the next three years with one eye camp each year, operating on a total of 225 patients.

The eighties proved to be a turning point for the meteoric rise in the number of patients seen and the number of operations that have restored vision. The foundation stone for the LKS eye hospital was laid in 1981 and until the end of the decade (in 1989) we organized as many as 211 camps operating upon 13,940 patients. In addition, we are credited with nearly 100 percent success rate. How did this remarkable achievement come to pass?

Experience has taught us to develop norms and criteria that are meticulously adhered to. Nothing is left to chance. For example, the moment a patient is selected for surgery, laboratory tests, especially for diabetics, and a complete general medical examination for hypertension, asthma, etc. are performed and a provisional admission card is given to the patient. This procedure also applies to patients living in far-flung villages. Our medical mobile unit goes there and conducts these tests in the village itself.

MOBILE EYE UNITS

We now have a completely mobile eye unit to look after patients in villages and remote places; but if any major problems arise, the patient can be transported to the main hospital in New Delhi. Our mobile unit, which is fully equipped with all necessary medicines, has an eye specialist, a nurse, a social worker, and a driver.

The functions of the mobile eye unit are as follows:

1. To conduct outpatient department (OPD) services in villages and give treatment to needy patients free of charge.
2. To select patients for surgery. These individuals are given provisional admission cards.
3. To perform a proper follow-up examination of those patients who have already been operated upon.
4. To remove stitches when required.
5. To bring the patients from collection points in villages to the main hospital and return them home after the operation.

An important link between the mobile unit and the patients is the presence of a medical social worker who works as a liaison between the villages and LKS. He or she consults with the doctor, schedules follow-up visits, organizes OPDs, brings the patients in for operation, and returns them to their villages after surgery. The social worker is fully responsible for complete programming of the mobile unit.

PROCEDURE FOR EYE SURGERY

To give maximal possible benefit to the poor we have regular eye camps that are organized as follows: admissions are on Wednesday, the operations are on Friday, and the patients are discharged the following Tuesday.

The moment a patient is selected by these camps for an operation everything is provided totally free of charge for him or her. Pathology tests, medicines, the operation itself, the hospital stay, food, eyeglasses, and the follow-up visits for six weeks are all provided free of charge.

Patients who come directly to our OPD are examined, those requiring an eye operation are registered and each is given a provisional admission card. This card contains the name of the patient,

his complete address, the type of operation required, and the date and time of the surgery. Patients are also treated for other health problems including diabetes, hypertension, and asthma.

Patients from remote places are picked up by our mobile vans after being selected earlier for operations by the mobile unit doctor. These patients also receive a general medical check-up and pathology tests from the mobile unit in their home village. These patients are also given provisional admission cards.

DAY OF ADMISSION TO THE HOSPITAL

Patients come on the prescribed day and time for admission with their provisional admission cards. A general eye examination is performed to confirm findings previously recorded. The type of eye operation needed and the sterile condition of the eyes are assessed. In a few cases test bandages are applied for 24 hours. Then a general examination by a physician is done to assess the present condition. The patient is admitted only after he or she is determined fit by the physician.

During the period in which patients are being examined by our doctors, their attendants, usually family members, are kept busy watching films in the auditorium. This makes our work easier because it keeps the attendants from interfering in our work.

TRANSIT EYE CAMP

A unique and important feature of our program is the transit eye camp. Here we admit patients who have been rejected from a camp because of one health-related reason or another, but who are expected to recover in time for the next camp. These are mostly poor villagers from remote places who, during their treatment period, will stay in good hygienic conditions, eat nourishing food, and receive the treatment they require, all free of charge.

Now is the time for patients and their attendants to learn exactly what their schedule will be until they are discharged and about the food and medicines they will be given. All of their questions concerning these and other related topics will be answered at this time.

SURGICAL PROCEDURE

In our Lok Kalyan Samiti Eye Hospital we have a most modern, air-conditioned operating theater. Four operations can be simultaneously conducted in this facility. Normally three surgeons operate while the next patient is being prepared, thus saving much time.

POSTOPERATIVE CARE

Patients are looked after by a staff that includes doctors, nuns, ward ayas (nurses), and boys. Important features of postoperative care include:

1. Presence of a resident eye surgeon 24 hours a day.
2. A physician on call 24 hours a day.
3. Ambulance service available 24 hours a day in case an emergency should arise.
4. Daily eye dressing during the patient's hospital stay.
5. Visitors are allowed to see the patients only between 4:00 and 6:00 p.m.
6. A medically advised menu of high nutritional value is given to the patients during their stay in the hospital.

DATE OF DISCHARGE FROM THE HOSPITAL

The final eye dressing is done and patients are told to remove their dressings after they have been at home for 48 hours.

Items issued at discharge to ensure good postoperative care:

1. Medicines including eye drops, ointments, and tablets to be used for a period of seven to ten days.
2. An instruction leaflet with "do's and don'ts" printed in English, Hindi, and Urdu.
3. A prepaid envelope with our hospital's address, so that the patient can inform us of any problem. (After receiving notice of such a problem, our mobile team is able to reach the patient within 24 hours.)
4. A food packet.
5. Finally, patients are advised to report to the hospital in case of any emergency. We will pay the travel costs spent by the patients.

Patients who have been accompanied by relatives are able to travel home with these attendants. Patients from villages (about 55–60 percent of the total) are generally transported home by our mobile vans.

FOLLOW-UP

A proper and timely follow-up is as important as the surgical procedure itself. We conduct a follow-up program for patients from outlying villages so that every one of them will be examined between seven and ten days after being released. If a patient requires re-admission during this period, he or she will be brought back to the hospital by van and will be re-admitted. Such patients will remain in the hospital until their problems have been rectified.

LKS SERVICES ARE PROVIDED FREE OF CHARGE

None of our services will be charged to the patient during a period extending to 40 days from the date of surgery. Eyeglasses will also be provided free of charge after a proper test is conducted in the mobile van.

CONCLUSION

The procedures outlined above constitute the typical cycle for restoring eyesight that transpires at the Lok Kalyan Samiti Eye Hospital in New Delhi. By following these procedures with a spirit to help and serve the people, we have progressively grown and achieved better and better results. Many voluntary agencies have visited us over the years to see the workings of LKS and to gain practical knowledge about our system and methodology. This has given us great satisfaction and has been a source of moral support to the LKS organization as a whole, allowing us to work with renewed enthusiasm.

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The Role of an International NGO in the Development of a Sustainable National Program

Dr. A.T. Jenkyns

It is a privilege to be sharing this section of the Plenary Session with the Chairman of the Kenya Society for the Blind. It was 20 years ago that a national NGO (the Kenya Society for the Blind) and an international NGO (the Royal Commonwealth Society for the Blind) joined hands with still another international NGO (Operation Eyesight Universal). Together this partnership continues to carry out a national program of rural eye care with a fleet of mobile eye units.

What I am going to say today applies to large-scale national programs and to small-scale NGOs. What are some strategic components as to how sustainable national programs might begin? First, I will discuss the knowledge and political will necessary to meet the needs of a particular geographical area.

A Mission Statement or clearly defined statement of objectives helps an organization concentrate on what the group is trying to accomplish. Starting small and efficiently leads to successful growth on a sound foundation. Being big is not always being better!

How can a program develop? Here are some thoughts: The key is to have a business plan. This begins with setting targets and outlining on paper what you want to do. This list of targets may be long, so list them in priority order according to their importance. The list may be beyond your present funding ability or manpower resources. If so, lay out your plan over five years with a 10-year horizon for targets.

Revise your plan each year so you are always looking into the future decade. The business plan should incorporate all components of your organization: program activities, fund-raising, administration, and personnel.

How do you work toward the goal of becoming self-sustaining? Unless it is your ultimate goal, you will never become self sufficient. Here are some suggestions about how to become self-sustaining. Work on a balanced budget. If you cannot raise the money—do not spend it!

Plan for and work toward increasing your own fund-raising capabilities in your own country. This reduces your dependency on foreign funding and makes you independent. We have as a partner a national NGO in Delhi, India, which is increasing its own fund-raising dramatically. In 1990, our support was $102,000, but in 1991 it will be $78,000. The NGO is carrying out a plan leading to its complete self-sustainability. This project partner is Lok Kalyan Samiti and its Honorary Secretary is Mr. Kalyan Gupta.

Build self-sustainability on your own manpower as well as funding. Over the years, the success of your program will depend on your ability to develop your own people to serve your own people!

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Corporate Interaction Relating to Future Prevention of Blindness Programs

Dr. J. Gmünder

TASK FORCE "SIGHT AND LIFE"

In view of its many years of experience in the field of vitamin A, F. Hoffmann-La Roche Ltd. felt duty-bound to offer its assistance in finding practical solutions to existing problems. To lend shape and greater force to previous activities, Task Force "Sight and Life" was founded in early 1986 to provide selective aid to combat severe vitamin A deficiency.

Roche believed that its knowledge and contacts over many years with leading international and private organizations would enable it to make an effective contribution to eliminating this urgent, worldwide health problem. Moreover, the Task Force aims to help research the complex interrelationships between nutrition and childhood mortality and morbidity.

From the beginning it was obvious that the Task Force should keep waste to a minimum and provide funds to promote suitable existing projects rather than create identical parallel programs. The activities of the Task Force are based on humanitarian grounds and are committed to work in the following fields:

1. Scientific and technical support for the development and implementation of vitamin A programs;
2. Donations of free vitamin A for active programs and in emergency situations; and
3. Financial contributions to research, education, and training projects.

The following priorities have been established:

1. The Task Force is active only in countries where a serious problem of xerophthalmia has been identified according to WHO criteria;

2. The projects selected for support must be backed by local health authorities; and
3. The infrastructure necessary for careful and proper implementation of the project must be available.

The Sight and Life program also has an information component. One objective of the Task Force is to raise the awareness of populations in industrialized countries about the problem of vitamin A malnutrition and xerophthalmia in the developing world and to encourage other organizations and enterprises to support concrete measures to combat blindness.

Creating awareness of a serious health and nutrition problem in the developing world may help to establish a sense of concern for the underprivileged and a climate of humanitarian solidarity so desperately needed in our world of disparity and distress. After 4.5 years of activity we feel that the aims and methods of our work have proved to be fruitful, particularly with the mixture of direct aid, financial backing, and technical support. During that period Sight and Life has supported 111 projects in 40 countries: 20 countries in Africa, 12 in Asia, and 8 in Latin America. We estimate that at least 2 million children have been reached.

Sight and Life provides one example of how private industry can contribute to help solve an urgent and compelling health problem in developing countries.

HEALTH EDUCATION—A FUNDAMENTAL ISSUE

Distribution of vitamin A capsules cannot be the ultimate goal of blindness prevention. Its aim should be enacted through nutrition and health-education programs to stress the principle of self-reliance.

Communication, training, and education are essential components in achieving that goal. Nutrition and health education involves the process of enabling people to increase control over the health of their families. This education is as fundamental as reading or arithmetic.

The factors that determine the health-related behavior of people lies beyond the individual level and includes community participation and social habits. Health promotion, therefore, requires social mobilization, community action, and strong political will to give clear priorities to health care for all.

To create a supportive environment, health promotion has to take a broad approach and concern itself with promoting changes and new health principles at various levels simultaneously.

Of paramount importance therefore is the existence of a local, skilled, and creative work force with commitment and quality leadership at all levels of responsibility.

The potential rewards obtained in return for introducing and adopting new nutrition-oriented practices are indeed attractive:

1. The prevention and control of nutritional blindness among preschool-age children;
2. A drastic decrease of child mortality and morbidity rates; and
3. A better quality of life.

It seems that these benefits would encourage everyone to strive to attain the necessary changes to have these life-saving innovations immediately introduced and observed.

Quite often, however, elements of deep-rooted social or emotional resistance growing from traditions may seriously hamper the quick adoption of even simple changes in lifestyle or eating habits.

Despite these well-known problems, we have good reasons to remain optimistic. Several case studies in the field of nutritional diseases have clearly demonstrated that health education programs, properly planned and implemented, may have a substantial and permanent impact on the health status of affected communities and population groups.

Industry can be an important partner and integrator in social development and effectively help target audiences.

Increasingly, the private sector is seeing health education as a worthwhile challenge, and is attempting to positively confront the problem, be it at the marketplace, at the workplace, or in the home. The private sector believes that through "participation in selected programs and projects of great social impact, the goal of encouraging self-reliance in developing countries will be met" (Industry Council for Development, 1990).

Let me close my remarks with a word from Dr. Hiroshi Nakajima, Director General of the World Health Organization, who said:

> "We must recognize that most of the world's major health problems and premature deaths are preventable through changes in human behavior and at low cost. We have the

know-how and technology but they have to be transformed into effective action at the community level.

"Parents and families, properly supported, could save two thirds of the 14 million children who die every year—if only they were properly informed."

14

Challenges and Priorities for the Delivery of Eye Care

Dr. G. Venkataswamy

INTRODUCTION

Eye-care services were very rudimentary in India before independence was granted by Great Britain in the 1940s. There were few eye hospitals in major towns and cities and training for eye surgeons was available only at Madras Ophthalmic Hospital. The first international effort, which was to control trachoma, was started by the World Health Organization in Delhi in 1956. A national survey was conducted to estimate rural blindness in India. Trachoma was endemic in several northern states of India and trachoma control was started by the application of tetracycline eye ointment in all schools and rural areas. Now trachoma is no longer a public health problem in most parts of India.

In 1971 the Government of India started the distribution of massive doses of vitamin A to prevent nutritional blindness in India's southern and eastern states. However, because only a small percentage of the children received vitamin A, this program did not make an impact on nutritional blindness. A current distribution program is attempting to give vitamin A to a larger percentage of children and the mass media is being used to educate the public on vitamin A deficiency. Nevertheless, blindness in children caused by vitamin A deficiency remains a public health problem.

Eye camps, which were started by a few pioneers to restore sight to cataract patients, have received good public support. Some voluntary hospitals have conducted eye camps and state governments have started supporting them. In 1961 the state government of Tamil Nadu sanctioned two mobile ophthalmic units, one at Madras and another at Madurai. I was asked to be in charge of the mobile ophthalmic unit at Madurai and four eye operation camps were to be conducted each year. A sum of $50 was sanctioned for each camp. We had

to solicit public support to feed the patients and medicines and free aphakic spectacles had to be provided to all the operated cases. We had numerous bilateral mature and hypermature cataracts and only these types of cataracts were admitted for operation. Clean rooms with good cement floors were selected and improvised as operating rooms after scrubbing and formal sterilization. Four to eight operating tables were provided with instrument trolleys. Electric sterilizers with boiling water were used to sterilize the blunt instruments and sharp instruments were sterilized with chemicals. Three or four surgeons operated at a time and over 150 to 200 cataracts were operated each day. The eye camps became very popular with the public and cataract patients came by the hundreds. We increased the operating teams and in some camps more than 1,000 cataracts were operated in a day.

LARGE-VOLUME CATARACT SURGERY

In the developing countries of the world there are at least 27 million blind people, the major cause of which is cataract. However, cataract patients do not need much postoperative care. In fact, in many countries they are treated as out-patients. With rural people coming from interior villages with poor communications we at the Aravind Eye Hospital keep them for four or five days. In addition, cataract patients can help themselves by going to the toilet or cafeteria and they do not need intensive care. They need only basic residence amenities: mats on the floor in a building can accommodate them. A team consisting of a well-trained eye surgeon and an ophthalmic nurse can operate 15 to 20 cataracts in three to four hours a day. If an intraocular lens is implanted as part of these surgical procedures, they may take an additional hour. Depending on the need, we can have five to ten surgeons operate in a day. All that is needed is to have more operating rooms with additional equipment. In Aravind's eye hospitals on just two days a week more than 100 cataract operations are routinely performed.

OPTIMAL MANPOWER UTILIZATION

It is necessary to train the surgical team to improve its skills through the use of intense coaching, similar to the training regimens used in many sports. Once their skills are perfected, they can be trained

to increase the number of operations they can perform in a day. Just as tennis players are coached to develop stamina so that they can play a match for two or three hours, in Aravind surgeons have been trained to operate 50 cataracts or more in a single day. Of course, proper facilities are required and you must have a large number of patients for such training. An average well-trained surgeon in Aravind performs 2,500 or more cataracts in a year. In Asian countries there is a need to do large number of cataracts. A recent survey in India estimates that 4 million new cases of cataracts occur each year. However, currently only 1.2 million cataracts are done each year. This has led to the current enormous backlog of over 17.5 million unoperated cataracts. We need to operate at least 5 or 6 million a year. It is possible to operate 30,000 to 40,000 cataracts in one hospital if we institute factory-like efficiency. If we had 100 such hospitals, we could operate nearly 4 million cataracts a year and, of course, reduce the backlog considerably. Although such a plan will require 3,000 to 4,000 eye surgeons, we have in India more than 6,000 eye surgeons at the present time. And we can train more eye surgeons each year. Therefore, optimal utilization of manpower will help to clear the backlog of cataracts in India.

REACHING RURAL POOR PEOPLE

Nearly 70 percent of the population of the country lives in villages, mostly working in agriculture and related occupations. They are poor and have a high rate of illiteracy. Unfortunately, they are not aware of the common causes of blindness and most of them have not been to a doctor in their life. The vast majority of eye surgeons are available only in large towns. Poor villagers feel too intimidated to travel to a town to see a doctor. In addition, a villager might lose his or her job and therefore have no money for travel to a town or to buy food for the journey.

We therefore have to identify local voluntary organizations such as Lions Clubs, Rotary Clubs, and religious or other groups to request them to organize screening eye camps. Their first task is to find a suitable place to collect a large number of people with eye problems and get a sufficient number of volunteers to help. They have to advertise their camp by posters, handbills, loudspeakers, and radio and other media. Some of the volunteers will be asked to help transport the cases selected for operation and feed them

while they are inpatients in the hospital. Unfortunately, because not all voluntary groups may be able to help, we have to find alternate sources of support. Most patients need free operations, free hospitalization, and free medicines.

Community awareness and participation are essential to restore sight to a high percentage of these rural people. Although some NGOs will support such an eye camp, a great deal of research is needed to perform the level of social marketing necessary to reach all of the eye patients who require eye surgery. In addition, it must be cost-effective.

SELF-SUPPORTING SERVICES

In developing countries there are several constraints to the delivery of eye care to all people in need. The state does not have adequate resources to do this, and most people do not have medical insurance. At the Aravind eye hospitals a model has been developed to make the institution self-supporting. First, quality care is made available to the community at a modest cost, attracting a large number of paying patients. The staff, including the doctors, work full-time at a fixed salary. The money generated from the paying patients is used for capital expenses like construction of buildings and on equipment and salaries. In addition, 800 or more screening eye camps are organized each year. A separate field staff is available to contact the voluntary organizations to set up 20 eye camps each week. We have 10 vehicles to take our staff to these eye camps. This entire operation has to be made self-supporting by efficient use of manpower, operating rooms, and equipment. We have to adopt industrial efficiency in all our operations.

THE CHALLENGE

If we can replicate the Aravind hospital model in hundreds of places in developing countries, we can build sustainable institutions to remedy the blindness problem in the world. However, this will require a strong group of talented people to train the manpower, control the finances, and maintain high quality. In the world today we find large multinational corporations producing needless products like cigarettes, yet they are making a lot of money. And often they are employing the best talent and using powerful marketing strategies

to hook people to use their products. Other powerful groups use their talents for selling drugs. If we could only use the available talent in the world today, it should be possible to eradicate hunger and many other diseases. We need people to manage large sums of money efficiently. And we must be able to train people efficiently and make the best use of them. Then we could adopt our base hospital technique and operate 30,000 or more cataracts per year at each hospital. The quality will be better and we will make optimal use of manpower and achieve cost-efficiency.

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Appropriate Technology for Eye Care

Dr. G. Venkataswamy

INTRODUCTION

Nearly two thirds of the world's population lives in developing countries of the world where the gross national product per capita is less than $1,000. The prevalence of blindness in most of these countries is more than 1.0 percent. There is also a scarcity of trained local eye doctors and ophthalmic technicians in these countries. Consequently there is considerable economic loss due to the backlog of cataract blindness in these countries and there is an urgent need to develop sustainable national programs with appropriate technology.

LOW-COST BUILDINGS

One of the most important aspects of a self-sustaining prevention of blindness program is to build low cost buildings that suit the weather and the way of living of the local people. At Aravind there is an out-patient area and inpatient wards to accommodate 70 patients plus an operating room, sterilization room, scrub room, and a store room. We also have sufficient bathrooms and toilets for the staff and the patients. The entire building cost $12,000, yet the patients feel at home and comfortable and operationally this hospital is very efficient.

OPERATING ROOM

The operating tables, instrument trolleys, stools, and sterilizers all were made locally and cost very little. The operating instruments were made in India or Pakistan and they are inexpensive, yet very good. They could probably be manufactured in most of the developing countries. Operating lamps with a sharp-focused light are made

in India and are priced cheaply. Electric generators are also available at a reasonable cost.

DRESSINGS

Swab sticks, eye pads, wipers, bandages, and irrigating solutions and eye drops are made by our nurses. In addition, all the linen for our staff and sheets for the patients are made locally.

SPECTACLES AND TRIAL SETS

These are also made in-country and are very inexpensive. However, we are now importing ophthalmoscopes. Locally made slit lamps, operating microscopes, keratometers, and indirect ophthalmoscopes are made and their quality is improving. Needles and sutures are also manufactured locally and they too are inexpensive. All this illustrates that we can have appropriate technology for adequate delivery of eye care in developing countries.

MANPOWER DEVELOPMENT—AUXILIARY WORKERS

Different countries have developed different types of ophthalmic workers to suit their needs. In some African countries trained medical assistants do cataract surgery. In India and other Asian countries each institution has trained its own technicians to assist the eye surgeons in the operating room, to give local anesthesia, and to help in the wards and outpatient areas. At the Aravind eye hospitals we train ophthalmic assistants to work in the operating room as well as in outpatient and inpatient areas. In addition, they are trained to do refraction, tonometry, and test for visual fields. They also do major work in screening eye camps. However, we do not have many trained nurses; most of them go to countries in the Middle East or to the United States.

COMMUNITY PARTICIPATION

We build strong contacts with the community and they help to organize eye camps—both screening and operating camps. This helps to educate the community regarding eye diseases and blindness.

School and college students learn about common causes of blindness such as cataract and vitamin A deficiency and motivate the people to attend the camps or hospitals. Lions Clubs give high priority to sight restoration operations and they help in several ways, including setting up eye banks, eye hospitals, and blind rehabilitation centers. Religious organizations and youth clubs also help in eye camps.

The practical difficulties in organizing operating eye camps are:

1. Want of school buildings or community halls. It is not easy to get adequately large halls for conducting eye camps except during school holidays.
2. The cost of running operation camps is high and it is not easy to get voluntary support.
3. We must keep the ophthalmologist at the camp site for the entire postoperative period (although this prevents optimal use of eye surgeons).
4. We need many volunteers to assist the patients, to take them to the toilets, and to feed them. However, it is not easy to find volunteers.
5. Food is more costly in the camps than in base hospitals.

Therefore, in India there is a shift to increase the work to the base hospitals. In the north of India cataract operations are not performed during the summer months in either the hospitals or in the eye camps. However, this results in poor utilization of the hospitals' beds that have been set aside for eye patients. Now efforts are made to operate cataracts during the summer months in these hospitals. This will help to restore sight to more cataract patients in India.

16

Monitoring and Evaluation of National Programs

Dr. R. Pararajasegaram

Monitoring and evaluation are integral components of the managerial process for programs of national health development and should be included in a national program aimed at preventing and controlling blindness.

Monitoring[1] is the term used for the continuous follow-up of activities to ensure that they are proceeding according to plan. It keeps track of achievement, staff movements and utilization, supplies and equipment, and the money spent in relation to the resources available, so that if anything goes wrong, immediate corrective action can be taken. The principles and practice of monitoring for the prevention of blindness (PBL) program would follow those of any other national program.

Evaluation[2] is the systematic assessment of the relevance, adequacy, process, efficiency, effectiveness, and impact of the program. Both monitoring and evaluation require the establishment from the outset of an appropriate information system at all levels, based on regular recording and reporting. Monitoring provides some of the information that is required for evaluation.

Both monitoring and evaluation have to be included at the planning stage and resources allocated in the budget for these purposes. For monitoring purposes, a time-bound plan of work is necessary. For evaluation, clear quantifiable objectives and targets should be set and suitable indicators chosen. Indicators would help measure changes in the eye-health situation either directly or indirectly.

Indicators may take various forms depending on what is to be evaluated, for example:

1. *Output*—The number of personnel trained by the program for cataract surgery.

2. *Outcome*—The number of cataract operations performed by the trained personnel.
3. *Impact*—The effect on the socioeconomic status of the beneficiaries and the community.

Whereas output and outcome are easier to measure, impact measurements require more exacting studies and are less tangible. In addition to these measures, evaluation may also assess relevance of the program and its adequacy. Specific indicators would need to be identified in respect of each of these.

The reader is referred to more detailed descriptions of these in other documents.[3,4,5]

Cost-benefit and cost-effectiveness are additional considerations. In the context of resource constraints generally associated with most health programs (and the prevention of blindness program is no exception) the need for cost containment and optimal utilization of resources is a major imperative. To contain costs without losing acceptable quality of care, evaluation should also include such issues as cost-benefit, cost-effectiveness, and cost-efficiency. Both cost-effectiveness and cost-efficiency assessments would help program managers make better decisions regarding alternative ways of achieving an objective and of optimizing services and resources respectively.

The following issues are important in terms of evaluation:

1. **Who performs the evaluation?**

   Evaluation is generally done as part of the program activity. It could be an internal evaluation by the personnel in the program or an outsider (called an external evaluation). National programs for the prevention of blindness, depending on their size and the degree of their integration with the general health-care system, would be evaluated as part of the latter or as an independent evaluation. Such is often the case where there is an input of external or extra-budgetary funds.

2. **When is the evaluation done?**

   Depending on the cycle of the health program, evaluation may be carried out on an annual or biennial basis, or as a terminal activity in the case of a project with a limited time frame. Often a midterm evaluation is less exhaustive than a terminal evaluation.

3. **What data are required for evaluation?**
   Reference has already been made to a built-in information system. However, it may be necessary to have recourse to rapid assessment survey techniques to determine the effect that the program has had on the eye-health status in the served community. Such surveys would be required particularly in respect of medium-term (0.5–5.0 years) and long-term targets (over 6 years). Some data that need to be obtained through appropriate surveys are:[6]
   - Short-term and medium-term (0.5–5.0 years)
   - Village-level randomized prevalence surveys:
     — of preschool-age children for active xerophthalmia (night blindness, Bitot's spots) and trachoma;
     — of adults over 50 years for blinding cataract and for trichiasis; and
     — of a small, representative group for relevant "knowledge, attitudes, and practices" concerning eye care
   - Long-term (more than 6 years)

A definitive prevalence survey for blindness from corneal disease (by cause), cataract, and other disorders (glaucoma and posterior segment disease).

USES OF EVALUATION FINDINGS

The findings of an evaluation are particularly useful both in reformulating and refining the program/project evaluated, and also to serve as an object lesson in planning similar projects to be replicated or initiated within or outside the country. Results of monitoring usually have more relevance to the particular project and help to streamline project activities, resource constraints, and bottlenecks; and they generally facilitate more efficient performance.

SUMMARY

Monitoring and evaluation are integral parts of any program for the prevention of blindness and should be budgeted for at the outset. Similarly at the outset, quantifiable objectives and targets should be set against realistic time frames and indicators must be identified

for future evaluation. Targets formulated in terms of clear outcomes would help to evaluate the impact of program activities and to ensure the relevance of such follow-up analysis to subsequent planning.

Both activities would save time, effort, and resources in the long term. A suitable reporting system needs to be incorporated into the program to facilitate both monitoring and evaluation.

The results of monitoring and evaluation would look not only at outputs and outcomes but also at the planning process, relevance, adequacy and, in the final analysis, impact in terms of eye-health status.

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PART 7

PLENARY SESSION VI

IAPB Business Meeting

WORLD BLINDNESS AND
ITS PREVENTION
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1

Outgoing President's Address

Dr. Carl Kupfer

This has been the most exciting eight years of my professional life. It has allowed me to continue to meet those individuals throughout the world who are committed to prevention of blindness and who provide the leadership and inspiration in this effort, but it has also allowed me to see the strengthening of the World Health Organization's Prevention of Blindness Program as well as the quantum leap forward of the non-government organizations in bringing significant resources to these programs and in developing a renewed collegial approach to their activities. In addition, a special note is in order to recognize the entry of the Lions' SightFirst Program into the arena of prevention of blindness activities.

It is traditional for the Outgoing President to review the accomplishments of his term of office. Although one could list an impressive array of meetings attended, seminars organized, and resolutions passed, I would like to call attention to three accomplishments which have, in my opinion, benefitted the prevention of blindness programs to the greatest extent.

During the past eight years, there have been 11 issues of the *IAPB News*, which now is mailed free of charge to over 4,500 people in 148 countries. This worldwide distribution has increased substantially the communication amongst the international NGOs, the WHO Regional Offices, the national committees and the many hundreds of professionals within ministries of health, hospitals, private and public hospitals, and organizations of and for the blind.

The second accomplishment that merits special attention is the formation of the NGO Coordinating Committee. Although the NGO organizations attended the Program Advisory Group meetings as observers, there was little opportunity to interact directly with the WHO Prevention of Blindness Program Manager during the press of business. The NGO Coordinating Committee was created consisting of the 10 NGOs within the IAPB to meet biannually with the Program Manager of the WHO/PBL program and his staff and

discuss in depth the coordination and cooperation amongst the NGOs and between the NGOs and the WHO that is so essential for the global program to succeed. I believe that this liaison has strengthened the effectiveness of all the organizations involved.

Thirdly, the broad representation by national delegates at this General Assembly reflects the efforts to encourage and assist national committees to become more active in IAPB affairs. There are 60 national delegations and over 400 registered participants here in Nairobi. The most recent National Committee for the Prevention of Blindness to join the IAPB has been from China. I only regret that the recent death of Professor Chan Chow Lu has not allowed this leader of Chinese ophthalmology to be present to witness the fruits of his efforts.

In closing my term of office, I would like to reflect on this Fourth General Assembly and what appeared to me to be a new theme emerging stronger than ever. The concepts of leadership and management have been introduced. Leadership refers to making the right choice such as choosing the right programmatic direction and the right priority judgments. After the right choice has been made, then management must see to it that the right choice is implemented efficiently. Whereas leadership involves aligning people toward a common vision and stimulating their interests, management is concerned with the details of project staffing, mobilizing needed resources, and attending to the many details necessary to do the job well.

In an eye-care delivery program, it is logical and appropriate for the ophthalmologist to provide leadership. However, there might be another individual better equipped through training and experience to carry out the day-to-day details of plan implementation and this individual is the manager. Once a programmatic direction is identified and a plan developed, the manager is responsible for implementation. We must incorporate this concept into creating self-sustaining eye-care delivery programs.

In summary, let us remind ourselves of the need to keep three thoughts in mind. First, to set priorities on allocation of scarce resources. It is better to do a few projects well in utilizing resources effectively and efficiently than to spread the same resources over many projects in a limited and inadequate manner.

Secondly, we must continually be concerned with the quality of the outcome of the project; this outcome should represent excellence in achieving stated objectives, whether it be in fully restoring

vision to the cataract blind or preventing blinding malnutrition. Evaluation will tell us whether we have delivered a quality service with constituent satisfaction. We should not settle for less.

Finally, and most important, we must at all times maintain a customer-oriented service mentality. In a sense, the blind are like hostages. They are held hostage to their disability and are held hostage to those of us who can make them see again. They have few, if any, options in their quest for a better life.

Accordingly, we must be especially conscious of the humanitarian aspect of our actions. This feeling for humanity must pervade our thinking, our planning, and our actions.

2

Incoming President's Address

Mr. Alan W. Johns

I am conscious of the fact that of all the tasks IAPB Presidents have responsibility for, this address to you this morning is likely to be the easiest.

Having been privileged to be a member of the Executive Committee of the Agency's Executive Board for the past four years, I am in a strong position to know what Dr. Carl Kupfer has coped with, the personality and enquiring scientific mind he has brought to this Agency's probing of its own capabilities, and the support he has given to the network of NGO Members that has developed during the eight years of his Presidency—all this with consummate ease and against the background of being Director of the National Eye Institute of the United States of America. On your behalf, then, I thank Dr. Kupfer for all the efforts and planning of those years and, conscious of the strength that a marriage brings to one's partner's capacity to serve, I would also like to express our appreciation to Kim, who is a highly dedicated member of the ophthalmic profession in her own right.

Someone who shall be nameless once told me that when a younger Carl Kupfer came to decide on his career, his deep love of music and exceptional ability to play the trumpet nearly took him on a different path. I am glad, for the Agency's sake, that ophthalmology triumphed.

Turning now to the future, you might expect that, raised in the heritage of the first President and working closely in IAPB affairs with the second, I have a strong sense of the Agency's philosophical core and the transference of that into practical forms of implementation through its constituent organizations and individual members. It was in 1984 that a small group of NGOs meeting in the WHO headquarters in Geneva decided very firmly that if the IAPB had not existed at that time, it would have been necessary to create it and ensure that it would provide strong long-term support to the WHO Program.

I said earlier this week that we had to formulate a domestic agenda consonant with the theme of this Assembly—prioritizing our objectives, enhancing the unique relationship between this remarkable cocktail of ophthalmologists, health planners, and NGOs, and taking a further step forward in advancing the work of regional and national committees. It will be my task to lead the Agency in formulating and implementing that agenda, together with advocating those sustainable strategies which you all have had a hand in identifying during this Assembly.

I thank you for the confidence you have expressed in my ability to undertake the role of President—I feel deeply honored and pledge my fullest support to the next four years of the Agency's work. Importantly to me with my deep faith in the ability of men and women to come together from different nations and cultures in that task, I have a strong team in the Executive Board and Regional Chairmen, many of whom I have worked with and respected for years—none more so than the President-Elect, Dr. Pararajasegaram.

I take this opportunity to wish you all a safe return to your homes and thank you in advance for your support over the next four years.

PART 8

Workshop Sessions

WORLD BLINDNESS AND
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1

First Workshop Session — Manpower Development

Prof. Gordon J. Johnson

Each level of manpower is discussed under the headings of:
Job description;
Recruitment;
Training, including standards and location;
Numbers; and
Support, including external sources.

Some of these topics, and particularly the job descriptions, have been thoroughly discussed and documented in the WHO Subregional Workshop on Manpower Development in Accra, 1988.

OPHTHALMOLOGISTS

Job Description

Ideally, the ophthalmologist should be the team leader of all the other eye-health professionals, especially if competent in management skills.

Recruitment

The problem of recruiting ophthalmologists who will practice in rural areas is common to many countries. Selection of medical students is usually based entirely on examination results from schools with no consideration to where the applicants plan to practice. Solutions include recruiting candidates for training from rural areas, and — as in Scandinavia — for it to be obligatory that part of the ophthalmic training be conducted outside urban areas.

It is important that undergraduates should receive good teaching in ophthalmology to attract them to the specialty, and also for new graduates to rotate through ophthalmology in their internship and early residency years. There is an opportunity for an undergraduate prize to be awarded by national prevention of blindness committees in different countries, and even by the International Agency for the Prevention of Blindness. This may help attract candidates not only into ophthalmology but increase interest in prevention of blindness.

Training

1. *Standards:* There was almost unanimous support for 2 levels of training. In a number of countries, successful diploma programs in ophthalmology have been held for many years. In Israel a 2 or 2.5 year diploma course has existed very successfully for the past 28 years side-by-side with a graduate course of 4.5 years. In other countries, such as Uganda, India, and Zimbabwe, the diploma program is of one- year's duration. It should be possible for the holder of a diploma to return to a residency program and complete the fellowship with further training if they wish. This is not at present possible in all countries having the two levels of training.
2. *Location:* It was recommended that training should take place in the ophthalmologist's own country, or at least in his subregion. Future medical school professors may well need to go outside the country for more sophisticated training. The value of links between training institutions in Africa with similar but more sophisticated institutions in the West was emphasized. And the importance of continuing medical education was highlighted.

Numbers

This would depend on the national plan and would vary from country to country. This was considered the province of the health planner.

Support

It was agreed that attractive, sustainable incentives should be developed. It was resolved that the National Committee for the

Prevention of Blindness should push for these. Examples already in place included tax-free salaries in polar regions, safari allowances, and per diem. It is important not to rely on supplements from a foreign non-governmental organization, which might have to terminate support at short notice.

NON-OPHTHALMIC CATARACT SURGEONS

The working group did not favor cataract technicians who did not have any other training in ophthalmology. They were ambivalent to the idea of general practitioners being trained to do cataract surgery. The solution of the diploma program that provides training in other aspects of ophthalmology as well as cataract surgery was much preferred. In certain countries there is an important role for ophthalmic assistants who, in addition, have been trained as cataract surgeons.

AUXILIARY SUPPORT

Objections were made to the name "auxiliary." Alternative suggestions were "other team members" or "other eye workers." It was noted that all these cadres of professionals should work under supervision and not independently of the ophthalmology profession.

These cadres of personnel include:

1. Community eye-health workers;
2. Integrated eye-care workers;
3. Ophthalmic assistants, including ophthalmic nurses;
4. Optical staff: optometrists, ophthalmic opticians, and optical technicians (who are not discussed in detail).

COMMUNITY EYE-HEALTH WORKER

Job Description

This person should be a member of the community where he or she works. The tasks of the community eye-health worker include health promotion (encouraging face washing and giving nutrition education), blindness prevention, (prophylaxis in new-born babies and by immunization), and curative work (such as giving tetracycline ointment and referring serious eye problems).

Recruitment

Recruitment depends on whether the workers are paid and this is the decision of the individual country. Usually they are chosen by the community and in some countries they may have to be approved by the chief.

Training

This should be as simple and practical as possible and close to the person's residence or place of work. It should not occupy more than one week. Most vital is teaching how to identify a blind person.

Support

A simple antimicrobial agent, vitamin A, and a visual acuity chart are needed. The maintenance of these supplies and equipment is essential. Community eye-health workers are supervised by the nearest available ophthalmic medical assistant or ophthalmic nurse.

INTEGRATED EYE-CARE WORKER

This group includes any health worker who has had some formal medical training and who, during the course of his or her routine work, is required to see eye patients. It includes nurses, medical assistants, and general practitioners doing routine medicine.

Job description

They carry out basic examinations of the eye, diagnose, and treat common causes of acute red eye. They should refer cataract, corneal problems, and other serious eye conditions to ophthalmologists.

Training

Training should be part of the normal curriculum, so that all health workers have the potential to become integrated eye workers. If they are already in post, they should, if possible, have a week-long in-service seminar. It was established that repeated training or repeated short seminars are more effective than a single long exposure. An ideal is have two courses, each of one week's duration, separated by six months.

Support

They need supplies and equipment to examine and treat eye patients and supervision by the nearest ophthalmologist or ophthalmic assistant.

OPHTHALMIC ASSISTANTS

Job Description

Ophthalmic assistants are qualified nurses or medical assistants who have had several years of experience in medical work before they are selected for specific training in ophthalmology. In some countries it is difficult to get the title of ophthalmic medical assistant recognized for purposes of pay and there may be difficulty in persuading policy makers to give these people a promotion. In rural Africa the ophthalmic assistant is the key person in providing eye-care services. A good name in some situations for a nurse eye worker is "ophthalmic nurse clinician."

The ophthalmic assistant should be able to diagnose and manage or refer all routine eye problems, perform eyelid surgery and other external procedures, organize and run outreach clinics, and provide training and supervision for other levels of personnel.

Training

The one-year training course is carried out in a number of centers. The Malawi training program takes 20 people a year but has far too many applicants for the limited vacancies. There will soon be similar programs developed in Lesotho and Zimbabwe. In Sudan there have been 20 students per class. Selection of the most suitable candidates is a problem because there is a wide variation in fundamental ability.

Support

It is important that there is a system of incentives and career prospects. There must be a government program with a formalized structure in which the training is recognized. Support includes adequate equipment, reliable supplies, and supervision by an ophthalmologist.

MANAGEMENT

In general, it was agreed that ophthalmologists do not know much

about management. In many countries, however, it is the ophthalmologist who bears the responsibility for management. There are several levels.

1. The management of programs at the national level is the responsibility of the national committee for the prevention of blindness.
2. Day-to-day operational management is the responsibility of the ophthalmologist.
3. At the hospital level, nurses are usually the managers. In a country like Kenya, however, there is no specific training course for ophthalmic nurses.
4. In the Onchocerciasis Control Program, there are professional managers who carry out procurement of equipment and many other similar functions. The ophthalmologists, nevertheless, must assume leadership.
5. Most programs cannot afford to pay a professional manager at the district level and therefore the ophthalmologists and other health workers must carry out management tasks.

TRAINING

In a number of courses the teaching of this subject may become very theoretical. A course in health administration of three months duration is available in Tanzania. Some training in management is included as a component in the newer ophthalmic curricula. There is also a journal entitled "Ophthalmic Management." It is still to be decided how much management training ophthalmologists require. Much depends on who else in the team can be used for some aspects of management.

2

Second Workshop Session— Delivery of Specific Eye-Care Services

Ms. Victoria M. Sheffield

The workshop group believed that IAPB should take a regional approach when making recommendations.

RECOMMENDATIONS:

1. Service delivery should be appropriate to the personnel available and to the infrastructure.
2. With regard to personnel, the ophthalmologist should play a leadership role in the area of prevention as well as clinical services. The ophthalmologist should also be a leader with regard to organization and management. Eye-care services can be delivered by two cadres of workers:

   Ophthalmic Medical Assistants (OMA)
   General OMAs
   OMA/Cataract Surgeons
   Ophthalmic Nurses

   Multipurpose Workers General
   General Physicians
   Nurses
   Health Assistants
   Community Health Workers

Ophthalmic-health workers are valuable in recognizing, treating, and/or referring conditions needing ophthalmic care and providing prevention education for common eye conditions. Multipurpose workers have a major role in health education and community awareness about eye conditions and how to prevent them. In general, the group felt that eye-care service delivery should have two major components:

Multipurpose Prevention
- Vitamin A Deficiency Control
- Onchocerciasis Control
- Support for Expanded Program on Immunization (EPI)
- Promotion of Face Washing to Control Trachoma
- Awareness of Harmful Eye Practices
- Community Education

Specific Curative
- Reduction of Cataract Blindness
- Treatment of Corneal Ulcers
- Trichiasis/Entropion Surgery
- Treatment of Glaucoma
- Treatment of Trauma
- Treatment of Refractive Error
- Treatment of Leprosy

MULTIPURPOSE PREVENTION

Vitamin A Deficiency Control

All eye-care programs in developing countries must include the treatment and prevention of xerophthalmia.

Recommendation: All children with measles should receive vitamin A to prevent blindness and reduce the risk of mortality.

Onchocerciasis Control

Current programs hope to provide Ivermectin to all those living in hyperendemic areas who are at risk of blindness.

Recommendation: Ivermectin distribution programs should employ simple screening methodologies to determine hyperendemic areas for targeting expanded distribution of Ivermectin.

Support for Expanded Program on Immunization (EPI)

The group was emphatic in their support for EPI programs.

Recommendation: All eye-care programs should support in all ways possible the promotion of EPI, especially measles vaccination. EPI vaccinators should be trained in the recognition, treatment, and prevention of xerophthalmia.

Promotion of Face Washing to Control Trachoma

Eye-care programs which include trachoma control should emphasize the following four main points.

Recommendations:

1. Programs should employ the new WHO/PBL Trachoma Grading Scheme. It is simple, in use, and reproducible.
2. Health workers and the public should be taught the importance of reinfection and how this must be prevented.
3. Community education in the control of trachoma should be a major activity. The importance of personal hygiene should continue to be stressed.
4. Ophthalmic medical assistants should all be proficient in the performance of surgery to correct trichiasis and entropion.

Awareness of Harmful Eye Practices

Eye-health education programs should include messages that discuss the common causes of eye injuries in the area. Additionally, education messages should address harmful traditional practices that are known to be used in the area and which causes eye injuries.

Recommendation: Eye health education messages should address the common causes of eye injuries in the area including harmful traditional practices.

Community Education

All eye health programs should have a strong community education component whether the teaching activities take place in a clinic or out in the community. Recommendations for specific eye health education messages are listed under other headings as appropriate.

SPECIFIC CURATIVE

Reduction of Cataract Blindness

Recommendations:

1. In countries where there are enough ophthalmologists to care for the population, ophthalmologists should be equitably distributed within the Ministry of Health System.

2. In areas where there are not enough ophthalmologists, an ophthalmic medical assistant/cataract surgeon cadre should be developed. Visiting surgeons who conduct cataract campaigns on a short-term basis should not be seen as substitutes for a cadre of cataract surgeons, but rather simply for the purpose of service delivery and teaching to develop a long-term solution.
3. Where there are neither ophthalmologists nor ophthalmic medical assistants, as is often the case on small islands, volunteer ophthalmologists making short-term visits are appropriate.
4. With regard to intraocular lenses, it is recommended that IOLs be used where the surgical and postoperative environment are appropriate. Part of this consideration is that the IOLs should be affordable either by the patient or by the health system.
5. IOLs are not recommended for use in children.
6. Outpatient surgery with local anesthesia should be encouraged whenever possible and wherever appropriate.

Treatment of Corneal Ulcers

Recommendations:

1. Children with clinical vitamin A deficiency who are at risk of blindness should be treated with vitamin A according to the treatment schedule recommended by the World Health Organization. Their caretakers also should be provided with appropriate information on the importance of feeding vitamin A-rich foods concurrently with treatment and thereafter—and not only to the affected child but also to other children within the family.
2. In countries where surgeons are trained to perform keratoplasty, governments should be urged to enact coroners laws to allow surgeons to remove corneal tissue for transplantation.

Trichiasis/Entropion Surgery

Recommendations under this heading are similar to those listed under face washing and trachoma control. Specifically, it is recom-

mended that OMAs be proficient in performing trichiasis/entropion surgery.

Treatment of Glaucoma

In developing countries, chronic open-angle glaucoma is difficult to diagnose. It is often virulent and holds socioeconomic importance because it affects young, productive adults as well as the elderly. When referrals come, they usually come from three groups: 1. general practitioners, 2. ophthalmic medical assistants or ophthalmic nurses, and 3. opticians or optometrists.

Recommendations:

1. Teach tonometry to ophthalmic medical assistants. It is not necessary to convert the tonometer reading into millimeters of mercury. The assistant should simply record the reading seen on the scale.
2. Ophthalmic medical assistants should also be taught to examine the anterior chamber from the side with an electric torch to examine for closed-angle glaucoma.
3. Screening should be limited to high-risk groups because of limited resources and the fact that services must be available to glaucoma patients who are identified.

Treatment of Trauma

Recommendations:

1. Identify the leading causes of eye injury in the local area or region.
2. Community education messages should include information about the leading causes of blindness due to trauma and how to prevent them.
3. Because many eye injuries are caused at work, community education should also take place in industry.
4. Community education should especially target children to teach them about the dangers that can injure their eyes and how to prevent them.

Treatment of Refractive Error

Recommendations:

1. Eye-health programs should have as a component the

development and maintenance of a low-cost spectacle workshop scheme.

2. Screening for refractive error can be done when spectacles are available and affordable to those being screened.

Treatment of Leprosy

Recommendation: Leprosy patients should be allowed into the general eye clinic for clinical treatment and surgery.

GENERAL RECOMMENDATIONS

1. Steroid medications should not be used in the eye except by an ophthalmologist or trained ophthalmic medical assistant.
2. There should be a major effort on the part of IAPB and its members to maximize eye-care services and facilities already available.
3. The development of schemes for the local production of eye drops should be encouraged.
4. The IAPB should work with regional and local representatives to create incentives that would encourage ophthalmologists to work in rural areas.

3

Third Workshop Session — Major Challenges and Priorities for the Delivery of Eye-Care Services

ANGLOPHONE WORKSHOP REPORT

Dr. Bjorn Thylefors

The overall challenge is slowing the growth of blindness as a public health and socioeconomic problem. The specific challenges to be tackled include:

1. Limited access to eye care, including both primary eye care and, perhaps even more, the delivery of eye care at the secondary level. There are three areas of concern in this context: urbanization and creation of slum areas; population growth, which is very pronounced in many developing countries; and the increasing number of elderly, who are particularly in need eye care.
2. Need to strengthen national blindness prevention programs.
3. Need to maintain the priority and visibility of blindness prevention in order to secure the allocation of resources for a sustainable program.
4. Insufficiency of resources, facilities, and proper equipment, including ophthalmic drugs.

To address the challenge of limited access to eye care, emphasis must be placed on the inception and strengthening of primary eye-care programs. The training of auxiliary personnel in eye care at community and district levels is the next priority. At the province level, there must be available, depending on the setting, a sufficient number of ophthalmologists or cataract surgeons. The distribution of manpower should be considered in relation to administrative

units, not only in total numbers for a country. The recommended criteria for personnel should be fulfilled: 1 ophthalmologist per 500,000 population; 1 cataract surgeon per 250,000 population; and 1 ophthalmic assistant or ophthalmic nurse per 100,000 population.

Other problem-solving proposals include promotion of teamwork and improved communications between medical staff and other sectors. Management must be introduced in all programs at the various operational levels.

With regard to manpower development, task-oriented training and a more flexible posting of staff between rural and urban areas must be given priority. Considering general population growth and the increasing number of elderly in all populations, planning must begin now for the situation in the year 2000, particularly for needed manpower and for cataract surgery.

To improve access to eye care in urban slums, primary health care again must be the main strategy. Work through other health programs, such as the Expanded Program on Immunization and Maternal and Child Health may be useful in some situations. It is important that the consumer's point of view concerning appropriate and acceptable eye care is always taken into account.

The first priority for strengthening national programs is to ensure the political will and commitment of the community. There must be clearly identified objectives and targets established for the program; and they must be meaningful to politicians and to the public, as well as being technically sound.

In many countries where primary eye care needs to be strengthened there is still a shortage of resources for the secondary level of eye care. The involvement and experience of local and international non-governmental organizations (NGOs) can be particularly useful in solving these problems. The NGO involvement should flow through the national committees once a planning process has been initiated to make the NGOs true partners in a developmental process.

One often-neglected source for manpower and public education is the local teaching staff at universities and other educational institutions. Another area in need of intensified efforts is program evaluation, which should be done periodically with the participation of NGOs.

In addition, the process of strengthening a national program should include the integration of program activities into general health care only after the program has been fully operational and has gained experience. This integration should be achieved in phases

in accordance with mutual agreements between the Ministry of Health and the NGOs.

To tackle the problem of maintaining blindness prevention as a priority for resource allocation, the following points may be considered:

1. A political lobbying system that stresses the importance of blindness prevention to decision-makers is helpful. Clear messages about what is needed, what is feasible, and what should be done immediately are vital.
2. The presentation of sound program activities with a clear-cut plan and rationale is important.
3. Having regularly available information about blindness prevention in general, and on specific ongoing activities is a must.
4. Making available the evaluation of achievements, including the impact of saving or restoring sight in relation to social and economic developments can lead to fruitful results.

The general insufficiency of resources for blindness prevention in many developing countries can be tackled in a multitude of ways, such as:

1. Sound program planning;
2. A good management (and expenditure) system;
3. Manpower development with emphasis on auxiliary staff and delegation of tasks;
4. Community participation; and
5. Low-cost technology, with standardization of equipment and supplies.

To illustrate the above points, the particular case of a sustainable cataract intervention program was considered in more detail.

CHALLENGE: To deliver cataract surgery to all those in need.

Proposed solutions:

1. Better use of ophthalmologists' time for cataract surgery and more practical training during residency;
2. Training of cataract surgeons on a task and performance basis;

3. Outpatient cataract surgery whenever possible;
4. Standardization of surgical procedure, equipment, and supplies needed, as well as a central purchasing arrangement, to which NGOs may contribute through their nonprofit purchase channels;
5. Case-finding at the community level, as part of primary eye care;
6. Overcoming socioeconomic barriers through public information and active community support; promotion by successfully operated cases;
7. Management and evaluation of achievements, in relation to objectives and targets set, also considering cost-effectiveness;
8. Appropriate, but low-cost technology, including aphakic spectacles and the local production of eye drops.

FRANCOPHONE WORKSHOP REPORT

Dr. Patrick Quequiner

The group from French-speaking countries set themselves the objective of defining the challenges and the constraints, encountered in the context of Sub-Saharan Africa, for the improved delivery of eye care in the future.

The primary objective is to make eye care accessible to all by the year 2000. The constraints encountered in attaining this objective have been: difficulties of access to health services; the population explosion and the change in distribution of the population; weaknesses in management practices; and the low level of attention and priority accorded to prevention of blindness programs by governments.

The proposals made to remove these obstacles are:

1. **Establish an effective primary eye-care delivery system.**

   To achieve this, emphasis should be placed on training auxiliary personnel at the primary level for community and district hospital work. At the secondary level, the hospital should have a team at its disposal, including a fully trained ophthalmologist.

   Dr. Allen Foster's proposed goals of 1 ophthalmologist per 500,000 inhabitants, 1 cataract surgeon per 250,000 inhabitants,

and 1 specialized nurse per 50,000 inhabitants appear to be realistic and designed to achieve the objectives accepted by the group.

The training of medical and paramedical personnel must be oriented towards those skills necessary to deal with specific eye-care problems.

The present distribution of medical personnel, which is concentrated in urban centers, is not rational. It will be necessary to persuade appropriate personnel to accept the types of ophthalmic exercises recommended: first by developing training courses in the use of public health methodology, and subsequently by improving the range of opportunities for personnel, including developing new methods of technical assistance and designing relevant career profiles.

At the end of the training period, each student should be integrated into the health system in an appropriate location and provided with the necessary equipment to carry out the tasks for which he or she has been trained. Equipment must be provided and suitable training must take place. In addition, the team that the student will lead must be organized at the outset of training.

2. **In response to the population explosion and to the new distribution of this population, in particular to the concentration around large cities, it will be necessary to:**
   - Assess training needs and the provision of health services based on available demographic projections for the year 2000 and not on the existing figures.
   - Ensure that account is taken not only of eye-care service delivery but also of other programs, such as EPI, and mother and child clinics.
   - Prepare for growing requirements in the field of geriatric ophthalmology.
   - Adapt services to respond to the emergence of new demands in the ophthalmic field, including diabetic retinopathy and macular degeneration.
   - Develop a better understanding of specific ocular problems and the provision of medical services in peri-urban zones, including shanty towns.

3. **To revive and reinforce programs in the fight against blindness, the Francophone group discussed weaknesses of the management process and considered that methods of planning and evaluation needed to be considered.**
    - Evaluation should take place after every phase and every stage of the program, with particular attention paid to cost-effectiveness.
    - Participating NGOs should be included and should be ready for renegotiation in the light of this experience and should collaborate in the extension or consolidation of the program.
    - The program should be tried and tested before integration takes place; and, in any event, the program director should stay close.
    - The competence of NGOs should be used in areas in which they are expert, such as the training of personnel or the developing of primary health-care services.

4. **To maintain high-quality, high-priority programs in the fight against blindness, planners and national health authorities must deliver a message that is clear, coherent, and acceptable by all the participants in the program. Their arguments, particularly on cost-effectiveness, must be well-reasoned and very convincing.**

Two examples were then chosen by the group: the treatment of cataract and the distribution of Ivermectin.

4

Fourth Workshop Session — Essential Characteristics of a Model Self-Sustaining Program

Mr. Kevin Carey

PANEL DISCUSSION ON COMMUNITY-BASED REHABILITATION WORKSHOP REPORT

Services for incurably blind people can be divided broadly into three types: education and counselling services for children and their families; vocational and rehabilitation services for blind people who could be expected to be active in paid or unpaid employment; and services for blind people with additional disabilities and/or those who are past working age.

When a child is diagnosed as incurably blind, concentrate on the forthcoming challenge to its parents. Ensure that advice is:

1. *coherent* and not in conflict with others in the medical team;
2. *realistic,* particularly in terms of the prognosis, because faint hopes or "miracle cures" can often hamper the process of adjustment to blindness;
3. *encouraging* by emphasizing that blindness is strictly a limited disability and not a tragedy; and
4. *practical,* establish where the parents should go for further assistance.

A blind child is a child first and blind second; not the other way around.

Most people who go blind in middle or late life can continue with many of their activities, but they will require a huge amount of encouragement and probably a modest amount of technical assistance and support. Being blind subjects people to a constant stream of minor technical problems that need to be overcome. The

importance of residual vision can not be over-emphasized, particularly because it is still widely believed that residual vision should be "conserved" and not used.

In developing countries there is usually some form of special education available for blind children; if provision is inadequate it is important to refer the child for the service so that demand for the service is created. Most countries have organizations of or for the blind dealing primarily with services for incurably blind adults and although their activities are often confined to capital cities, again, referral for the purposes of demand creation is important.

Where there are no special services, there is much that the blind person, his/her family, and the community can do to improve the situation. Economic activity for those of working age is important but the key concepts are dignity, respect, and participation—and all of these are possible for a blind person without the assistance of specialized agencies.

Two positive recommendations grow out of this discussion: first, all eye-care workers should receive basic instructions on the way incurably blind people function and should know about special services and registration procedures; secondly, emphasis in diagnosis and prognosis should be on the whole person and family rather than being merely a narrow consideration of ocular pathology.

PART 9

Banquet and Awards Ceremony

1

IAPB Lifetime Awards
presented at the Fourth General Assembly

PROF. ANTOINETTE PIRIE

Following an illustrious career in the biochemistry of the visual system, Professor Pirie occupied the Nuffield Chair in Ophthalmology at the Radcliffe Eye Hospital and Oxford University. Professor Pirie then turned her research efforts to the challenge of blinding malnutrition and launched a new career in which she combined laboratory animal research with clinical field work in India. In so doing, she developed new laboratory tests to determine high-risk children. In addition, she created new strategies to provide nutrition education to parents of affected children so that upon their return to the village, these parents would influence the eating practices within the village so that all parents would provide a diet rich in vitamin A. The legacy of this work lives on in many locations in southern India. Dr. Antoinette Pirie's strategy of nutrition education and kitchen gardens, developed almost two decades ago, has now become one of the major approaches to the problem of blinding malnutrition.

DR. VIGGO CLEMMESEN

With the inception of the IAPB in 1975, Dr. Clemmesen expanded his Denmark-based prevention of blindness activities and focused on Scandinavia and subsequently the entire world. In his capacity as Registrar of the IAPB, he has devoted hundreds of hours of unreimbursed effort to help us build a strong association of national committees. In so doing, he has imbued the IAPB with a sense of commitment to the worldwide fight against avoidable blindness. Dr. Viggo Clemmesen clearly exemplifies how one person's contributions can make a major difference in global prevention of blindness programs.

DR. MOSES C. CHIRAMBO

Dr. Chirambo's collaboration with the late Prof. Isaac Michelson, which began two decades ago, has led to the establishment of the Southern African Regional Training Centre in Malawi, where he has developed a curriculum for primary eye care and trained scores of ophthalmic auxiliary personnel. Perhaps even more impressive has been the leadership by example that he has provided to much of the African continent. Primarily through the assiduous efforts of Dr. Moses Chirambo, one of the foremost ophthalmologists in the developing world, prevention of blindness projects are increasing more rapidly in Africa than in any other region of the globe.

DR. FRANCISCO CONTRERAS

One of the early pioneers in prevention of blindness in Latin America, Dr. Contreras has established a program in Peru that has become a model for other countries in that region. His program includes training village health workers to detect major eye pathology, enhancing the capabilities of ophthalmic assistants by teaching them how to give more detailed eye examinations and how to provide simple treatment, and developing ophthalmologists in the excellent residency program in his hospital. His recent successes in implementing the Cataract-Free Zone concept, his organizing a National Eye Institute in Lima, and his outstanding leadership as Executive Director of the Pan-American Association of Ophthalmology clearly identify Dr. Francisco Contreras as an extraordinarily effective long-time leader in community ophthalmology.

DR. CHENG HU

A true disciple of Drs. Eugene Chen and Winifred Mao, Dr. Cheng Hu has continued and expanded the tradition of community ophthalmology in China. With the first scientifically designed prevalence survey in the mid-1980s, he has drawn the attention of the Chinese Ministry of Health to the magnitude of the blindness problem in his country. In addition, Dr. Cheng Hu has been the primary catalyst in organizing the National Committee for the Prevention of Blindness in China and has brought that Committee into membership within the International Agency for the Prevention of Blindness.

DR. RABIUL HUSAIN

With exceptional skill, Dr. Rabiul Husain has harnessed the extraordinary external resources that have been made available in Bangladesh and has established an outstanding training and outreach facility for the delivery of eye care in the Chittagong region. The construction of the Chittagong Eye Infirmary and Training Complex has made us all aware of the dedication, initiative, and energy that Dr. Husain has brought to prevention of blindness activities in Bangladesh. The Chittagong Complex offers training courses for physicians and ophthalmic paramedics and has become a superb model of community ophthalmology for South-East Asia and other parts of the world that share the common problems of eye care delivery. What is particularly exceptional is that Dr. Rabiul Husain has accomplished this in a remarkably short period of time and in a manner that has maintained the highest standards of safety and efficacy in patient care.

MR. ISMAILA KONATE

Mr. Ismaila Konate, the current president of the Mali National Union of the Blind, was the founder and principal force behind the development of educational and social work for the blind in Mali. He has also been a leading member of the national organization for the prevention of blindness in Mali, and he is president of the African Union of the Blind, which is the African regional component of the World Blind Union. Mr. Ismaila Konate is one of the truly outstanding leaders in the effort to eradicate avoidable blindness.

PART 10

Appendices

Appendix A

National Delegates to the Fourth General Assembly

Each of the following 113 people from 60 countries was nominated by his or her Ministry of Health or national prevention of blindness committee and accredited by the IAPB Executive Board to be a "national delegate" to the Fourth General Assembly. These delegates were thereby authorized to vote on behalf of their national committees on any special resolutions at this General Assembly's Business Meeting.

According to Article VI of the IAPB Constitution: "National delegates may be appointed from any country in which there exists a national committee or national organizations (or any approved grouping of such committees and organizations) recognized by the Executive Board as entitled to appoint that country's national delegates. The Executive Board may withhold such recognition if it considers that the nominating committee, organization, or group is insufficiently representative of the organizations and interests concerned with the prevention of blindness in that country.

"The number of national delegates which may be nominated for appointment from any country shall be related to the size of that country's population as revealed in the most recent national census. A country with a population not exceeding 5 million may appoint one delegate. A country with a population of more than 5 million but not exceeding 20 million may appoint two delegates. A country with a population of more than 20 million but not exceeding 50 million may appoint four delegates. A country with a population of more than 50 million may appoint six delegates."

Article IX, Section 2, states: "Only national delegates, international delegates, and members of the Executive Board may vote on a special resolution as defined in Article VIII, Clause 3, of this Constitution."

The latter article defines a special resolution as one that concerns: (a) the amendment of the Constitution; (b) the number of members in each group of the Executive Board and the election of members in Groups A, B, C, and E of the Board; (c) approval of the financial estimates of the Agency; and (d) the dissolution of the Agency.

Article IX, Clause 6, states: "A national delegate who is unable to attend a session of the General Assembly may authorize another member of his national delegation to exercise a proxy vote on his behalf."

The following is a list of those delegates who were in attendance or who used a proxy at the Fourth General Assembly Business Meeting.

Australia
Dr. Frank Billson
Dr. Henry S. Newland
Dr. Hugh Taylor

Bangladesh
Begum Raushan Ershad
Dr. Rabiul Husain
Prof. M.A. Matin
Mr. Abu Baker Siddique

Belgium
Dr. Jean-Paul Herbecq

Botswana
Dr. Kealeboga Makhwade

Brazil
Dr. Alzira Nicolini Delgado
Dr. Newton Kara-José

Burkina Faso
Dr. Virginie Tapsoba

Cameroon
Dr. Theodosia E. McMoli

Canada
Dr. A.T. Jenkyns
Ms. Maureen McManus

Central African Republic
Dr. A. Auzemery

Chile
Dr. Rene Canovas Emhart
Dr. Eugenio Maul

China
Dr. Cheng Hu
Dr. Wenbin Lo
Dr. Sun Bao-chen
Dr. Zikuan Zhang

Colombia
Dr. Virgilio Galvis

Denmark
Dr. Ernst Goldschmidt

Ethiopia
Dr. Pawlos Quana'a

France
Gen. Marcel Chovet
Dr. Pierre Huguet
Prof. Patrick Queguiner
Dr. Serge Resnikoff

Gambia
Dr. Hannah B. Faal

Germany
Dr. Volker Klauss

Ghana
Dr. Maria Hagan
Dr. J.D. Otoo

Guatemala
Rosa Amalia de Vasquez
Dr. Fernando Beltranena

Guinea
Dr. Adiatou Sylla

India
Dr. R. Jose
Dr. S.R.K. Malik
Dr. Anita Panda
Dr. P. Siva Reddy
Dr. H.K. Tewari
Dr. G. Venkataswamy

Indonesia
Dr. Bambang Hamurwono
Dr. Istiantoro

Israel
Dr. Lutza Yanko

Japan
Dr. Atushi Kanai
Dr. Kazuichi Konyama
Dr. Akira Nakajima
Dr. Kenji Yanashima

Kenya
Prof. Henry S. Adala
Dr. A.K. Gikonyo
Dr. Ashok K. Shah
Mr. Samuel K. Tororei

Lao People's Democratic Republic
Dr. Vithoune Visonnavong

Lesotho
Dr. Musi Mokete
Dr. F. Rathabaneng

Madagascar
Dr. Rakotomalala Mireilli

Malawi
Dr. Moses C. Chirambo

Mali
Mr. Ismaila Konate
Mr. Moussa Bado

Morocco
Dr. Youssef Chami Khazraji

Mozambique
Dr. Yolanda T.D.C. Zambujo

Myanmar
Dr. Tun Aung Myaw

Nepal
Dr. R.P. Pokhrel
Dr. S.P. Lakhey

Netherlands
Dr. J.S. Stilma

Nigeria
Prof. Adenike Abiose
Dr. U.F. Ibrahim
Prof. A.A. Majekodumni
Dr. Chito Obowu

Norway
Dr. Oddvar Otterlei

Pakistan
Dr. Jamshed Wania

Papua New Guinea
Dr. Bage Yaminao

Peru
Dr. Francisco Contreras

Philippines
Dr. Ronaldo A. Paraan

Saudi Arabia
Sheikh Abdullah M. Al-Ghanim
Mr. Saleh Abdullah Al-Majid

Senegal
Prof. Joseph Diallo

Sierra Leone
Dr. Aveline Horton
Dr. D. Williams

Singapore
Dr. Lim Kuang Hui

Somalia
Dr. Mohamed A. Shilkey

Spain
Dr. Elvira Martin
Mr. Antonio Martinez
Mr. Rafael Mondaca

Sri Lanka
Dr. M.R.L. Perera
Dr. Tilak Thinasiaghe

Sudan
Dr. Hadi Elsheikh
Dr. K. Mohammed

Sweden
Dr. Elisabeth Aurell

Tanzania
Dr. Walter Jana
Dr. S.B. Katenga
Dr. N.N. Kinabo
Mr. William Mindolo

Thailand
Dr. Suchint Phalakornkule
Dr. Emorn Udomkesmalee

Tunisia
Dr. Ahmed Trabelsi

Turkey
Dr. Füsun Sayek

Uganda
Dr. K. Mushega

United Kingdom
Mr. Alan W. Johns
Prof. Gordon J. Johnson
Sir John Wilson
Lady Wilson

United States
Dr. Suresh Chandra
Mr. Oliver Foot
Dr. Suzanne Gilbert
Ms. Meredith Lloyd
Prof. Alfred Sommer
Dr. Barbara A. Underwood

Yemen
Dr. Ibrahim El-Gorafi

Zambia
Mr. David Mwandu

Zimbabwe
Mr. W. Sithole
Dr. S. Guramatunhu

Appendix B

World Health Organization Regional Offices, Collaborating Centers for the Prevention of Blindness, and Member Nations by Region

WHO REGIONAL OFFICES

World Health Organization
Regional Office for Africa
P. O. Box 6
Brazzaville
Congo

Pan American Health Organization
Regional Office of the World Health Organization
525 23rd Street, N. W.
Washington, D. C. 20037
USA

World Health Organization
Regional Office for the Eastern Mediterranean
P. O. Box 1517
Alexandria 21511
Egypt

World Health Organization
Regional Office for Europe
8, Scherfigsvej
DK-2100 Copenhagen
Denmark

World Health Organization
Regional Office for South-East Asia
World Health House
New Delhi 1.10.002
India

World Health Organization
Regional Office for the Western Pacific
United Nations Avenue
P. O. Box 2932
Manila 2801
Philippines

WHO COLLABORATING CENTERS FOR THE PREVENTION OF BLINDNESS

The African Region

Institut d'Ophtalmologie tropicale de l'Afrique
B.P. 248
Bamako
Mali
(Director: Dr. Serge Resnikoff)

The Region of the Americas

International Center for Epidemiologic
and Preventive Ophthalmology
The Dana Center
The Wilmer Ophthalmological Institute
The Johns Hopkins School of Hygiene and Public Health
600 North Wolfe Street
Baltimore, Maryland 21205
USA
(Director: Prof. Alfred Sommer)

National Eye Institute
National Institutes of Health
Building 31, Room 6A03
Bethesda, Maryland 20892
USA
(Director: Dr. Carl Kupfer)

Dr Rodolfo Robles V Eye & Ear Hospital
National Committee for the Blind and Deaf
4a Avenida 2–28, Zona 1
Guatemala City
Guatemala
(Director: Dr. Fernando Beltranena)

Centro Oftalmologia "Luciano Barrere"
Santo Toribio de Mogrovejo Hospital
Jr. Ancash 1271
Lima
Peru
(Director: Dr. Francisco Contreras)

Francis I. Proctor Foundation for Research in Ophthalmology
University of California, San Francisco
San Francisco, California 94143
USA
(Director: Dr. Chandler R. Dawson)

Servico de Oftalmologia Sanitaria
Secretaria de Estado da Saude
Av. Dr Eneas de Carvalho Aguiar No. 188
8° Andar
Caixa Postal 8027
São Paulo, S.P. 05403
Brazil
(Director: Dr. O. Monteiro de Barros)

The Eastern Mediterranean Region

Institut d'Ophtalmologie
Bab-Saadoun
Tunis
Tunisia
(Director: Prof. S. Ayed)

King Khalid Eye Specialist Hospital
P. O. Box 7191
Riyadh 11462
Saudi Arabia
(Director: Dr. Ihsan A. Badr)

The European Region

International Centre for Eye Health
Department of Preventive Ophthalmology
Institute of Ophthalmology
University of London
27/29 Cayton Street
London, EC1V 9EJ
United Kingdom
(Director: Prof. Gordon J. Johnson)

Department of Viral and Allergic Eye Diseases
Helmholtz Research Institute of Ophthalmology
Sadovaja-Chernogriazslakaj 14/19
Moscow 103064
Russia
(Director: Prof. Y.F. Maichuk)

The South-East Asia Region

Dr Rajendra Prasad Centre for Ophthalmic Sciences
All-India Institute of Medical Sciences
Ansari Nagar
New Delhi 110016
India
(Director: Prof. P.K. Khosla)

The Western Pacific Region

Department of Ophthalmology
Juntendo University School of Medicine
3–1-3 Hongo
Bunkyo-ku
Tokyo 113
Japan
(Director: Prof. Atushi Kanai)

Beijing Institute of Ophthalmology
Tong Ren Hospital
2 Chong Nei Street
Beijing
People's Republic of China
(Director: Dr. Shi-Yuan Zhang)

WHO MEMBER COUNTRIES BY REGION

The 75 countries that have a national prevention of blindness committee affiliated with the IAPB are in **bold.**

The African Region

Algeria, Angola, Benin, **Botswana**, **Burkina Faso**, Burundi, Cameroon, Cape Verde, **Central African Republic**, Chad, Comoros, Congo, Equatorial Guinea, **Ethiopia**, Gabon, **Gambia**, **Ghana**, **Guinea**, Guinea-Bissau, Ivory Coast, **Kenya**, **Lesotho**, Liberia, **Madagascar**, **Malawi**, **Mali**, Mauritania, Mauritius, **Mozambique**, Niger, **Nigeria**, Rwanda, São Tome and Principe, **Senegal**, Seychelles, **Sierra Leone**, **South Africa**, Swaziland, **Tanzania**, Togo, **Uganda**, Zaire, **Zambia**, **Zimbabwe**.

The Region of the Americas

Antigua and Barbuda, **Argentina**, Bahamas, **Barbados**, Belize, **Bolivia**, **Brazil**, **Canada**, **Chile**, **Colombia**, **Costa Rica**, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, **Guatemala**, Guyana, **Haiti**, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, **Peru**, St. Christopher and Nevis, St. Lucia, St. Vincent and The Grenadines, Surinam, Trinidad and Tobago, **United States of America**, Uruguay, **Venezuela**.

The Eastern Mediterranean Region

Afghanistan, Bahrain, Cyprus, Democratic Yemen, Djibouti, **Egypt**, Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan, **Morocco**, Oman, **Pakistan**, Qatar, **Saudi Arabia**, **Somalia**, **Sudan**, Syrian Arab Republic, **Tunisia**, United Arab Emirates, **Yemen Arab Republic**.

The European Region

Albania, Austria, **Belgium**, Bulgaria, Belarus, Czechoslovakia, **Denmark**, Estonia, **Finland**, **France**, **Germany**, Greece, Hungary, Iceland, Ireland, **Israel**, **Italy**, Latvia, Lithuania, Luxembourg, Malta, Monaco, **Netherlands**, **Norway**, **Poland**, Portugal, Romania, **Russia**,

San Marino, **Spain**, **Sweden**, Switzerland, **Turkey**, Ukraine, **United Kingdom**, **Yugoslavia**.

The South-East Asia Region

Bangladesh, Bhutan, Democratic People's Republic of Korea, **India**, **Indonesia**, Maldives, Mongolia, Myanmar (Burma), **Nepal**, **Sri Lanka**, **Thailand**.

The Western Pacific Region

Australia, Brunei Darussalem, **China**, Cook Islands, Democratic Kampuchea, **Fiji**, **Japan**, Kiribati, **Lao People's Democratic Republic**, **Malaysia**, **New Zealand**, **Papua New Guinea**, Philippines, **Republic of Korea**, Samoa, **Singapore**, Soloman Islands, Tonga, Vanuatu, Vietnam.

Appendix C

IAPB Leadership 1990–94

OFFICERS

President
Mr. Alan W. Johns

Honorary President
Sir John Wilson

Immediate Past President
Dr. Carl Kupfer

Senior Vice President and President-Elect
Dr. R. Pararajasegaram

Vice Presidents

Dr. Akira Nakajima—(President, International Federation of Ophthalmological Societies)

Mr. Duncan Watson—(President, World Blind Union)

Rev. Christian Garms—(Chairman, Non-Governmental Organizations Consultative Group)

Dr. Moses C. Chirambo—Africa

Dr. Francisco C. Contreras—Latin America

Dr. P. Siva Reddy—Asia

Prof. Frank Billson—Pacific

Treasurer
Dr. A.T. Jenkyns

Registrar/Secretary
Mrs. Virginia Boyce

REGIONAL CHAIRMEN AND CO-CHAIRMEN

African Region
Chairman: Dr. Moses C. Chirambo
Co-chairman for East: Mr. Samuel K. Tororei
Co-chairman for West: Dr. Joseph S. Diallo

American Region
Chairman for North: Dr. Carl Kupfer
Co-chairman for North: Mrs. Virginia Boyce
Co-chairman for North: Mr. John M. Palmer, III
Chairman for South: Dr. Francisco C. Contreras
Co-chairman for South: Dr. Fernando Beltranena
Co-chairman for South: Dr. Newton Kara-José
Co-chairman for South: Dr. Eugenio Maul

Eastern Mediterranean Region
Chairman: Sheikh Abdullah M. Al-Ghanim
Co-chairman: Dr. M. Daud Khan
Co-chairman: Dr. Ridha Mabrouk

European Region
Chairman: Gen. Marcel Chovet
Co-chairman for West: Dr. Volker Klauss
Co-chairman for East: Dr. Petja Vassileva
Co-chairman for East: Prof. Y.F. Maichuk

South-East Asia Region
Chairman: Dr. S.R.K. Malik
Co-chairman: Dr. Rabiul Husain
Co-chairman: Dr. R.P. Pokhrel
Co-chairman: Dr. Phanom Sanitprachakorn

Western Pacific Region
Chairman: Prof. Frank Billson
Co-chairman: Dr. Lim Kuang Hui
Co-chairman: Prof. Kazuichi Konyama

EXECUTIVE BOARD MEMBERS

Group A
Appointed by the International Federation of Ophthalmological Societies:

Members	*Alternates*
Dr. Madan Mohan	Dr. Cheng Hu
Gen. Marcel Chovet	Dr. C. Mortimer
Dr. Newton Kara-José	Dr. A.S.M. Lim
Dr. K.Y. Dadzie	Dr. J. Diallo
Dr. Ihsan A. Badr	Dr. Kazuichi Konyama

Group B
Appointed by the President of the World Blind Union (WBU), subject to confirmation by the WBU Executive Board:

Members	*Alternates*
Sheikh Abdullah M. Al-Ghanim	Shahid Ahmed Memon
Dr. Franz Sonntag	Mr. Horst Stolper
Sra. Dorina de Gouvea Nowill	Sra. Molina de Stahl
Dr. Rajendra Vyas	Mr. Suresh C. Ahuja
Mr. William Gallagher	Mr. David Blyth

Group C
National Members:

Members	*Alternates*
Dr. Hannah B. Faal (Gambia)	Prof. Henry S. Adala (Kenya)
Prof. Adenike Abiose (Nigeria)	Mr. Samuel K. Tororei (Kenya)
Dr. Delia Durango (Ecuador)	Dr. Eugenio Maul (Chile)
Dr. F. Beltranena (Guatemala)	Mr. Wilburt Williams (Jamaica)
Dr. Sun Bao-chen (China)	Dr. Bage Yaminao (Papua New Guinea)
Mrs. Akiko Iwahashi (Japan)	Prof. Hugh Taylor (Australia)
Dr. S.R.K. Malik (India)	Dr. Rajendra Vyas (India)
Dr. Rabiul Husain (Bangladesh)	Dr. Reggie Seimon (Sri Lanka)
Dr. Ahmed Trabelsi (Tunisia)	Dr. Jean-Paul Herbecq (Belgium)
Prof. Gordon J. Johnson (UK)	Dr. Füsun Sayek (Turkey)

Group D
Scientific disciplines other than ophthalmology:

Member

Prof. Alfred Sommer
(Public Health)

Group E
A representative from each of the following international and non-governmental organizations:

Christoffel-Blindenmission
Foresight
Helen Keller International
International Eye Foundation
Norwegian Association of the Blind and Partially Sighted
Operation Eyesight Universal
Organisation pour la Prévention de la Cécité
Project Orbis
Seva Foundation
Sight Savers

Group F
Individual members by reason of an outstanding contribution to international prevention of blindness activities:

Dr. Joseph Taylor
Dr. Bjorn Thylefors
Dr. R.P. Pokhrel
Prof. G. Venkataswamy

Honorary Life Members
Sir John Wilson
Prof. Barrie R. Jones

Appendix D

Constitution of the International Agency for the Prevention of Blindness

ARTICLE I—Formation and Name

1. **Formation**
   An international, non-governmental organization is hereby created by organizations concerned internationally with blindness and with ophthalmology to take over and expand the activities of the International Association for the Prevention of Blindness.

2. **Name**
   The official name of the Agency shall be "International Agency for the Prevention of Blindness" (henceforward in this Constitution referred to as "the Agency").

ARTICLE II—Commencement

The Agency comes into operation on the first day of January 1975, from which date the International Association for the Prevention of Blindness ceases to exist and all the assets and liabilities of the said Association are transferred to the Agency.

ARTICLE III—Headquarters

The Headquarters of the Agency shall be located at a place designated by the Executive Board.

ARTICLE IV—Purpose and Powers

1. **Purpose**
   The purpose of the Agency is to promote the prevention and

cure of blindness (which expression unless the context otherwise indicates, shall include impaired vision) and to preserve sight.

2. Powers

The Agency may take any action which is conducive to the attainment of its purpose, including:

(a) To investigate and make known the causes, extent and consequences of blindness and to promote, support and encourage all or any measures designed to prevent, cure, reduce or remedy diseases, conditions and causes which produce blindness.

(b) To cooperate with the United Nations and its specialized agencies, with Governments and with national and international organizations concerned in any way with blindness and its prevention and to provide opportunities and facilities for such cooperation and for the coordination and development of the activities of cooperating organizations. To promote and support the establishment, maintenance and development of national and regional organizations and committees for the prevention and cure of blindness.

(c) To advance the science, practice and study of ophthalmology, to encourage research, and to foster international and multidisciplinary cooperation between scientists of different disciplines.

(d) To mobilize and assist in the mobilization of resources including the raising of funds, the acceptance of grants, bequests and gifts of all kinds, and the stimulation of governmental support for national and international action to prevent and cure blindness. To undertake and execute any trusts which may lawfully be undertaken by the Agency and to invest the funds of the Agency in such investments, securities and property as may be approved by the Executive Board.

(e) To promote the incorporation, registration and recognition of the Agency in any country of the world and to promote the establishment, maintenance and development of any trust, fund or organization whose objects are conducive or incidental to the attainment of the purpose of the Agency, provided that in any country in which the Agency is

registered as a charity, the Agency shall not undertake any activity which is contrary to such charitable status.

(f) To collaborate with and support the activities of the World Blind Union, the International Federation of Ophthalmological Societies, and to continue the activities of the International Association for the Prevention of Blindness.

(g) To engage and remunerate employees, to institute pension schemes and other appropriate benefits for employees, ex-employees and their dependents and to pay appropriate remuneration to any person whose services are required in connection with the activities of the Agency provided that no officer or member of the Executive Board shall receive any salary or remuneration other than reimbursement of expenses which, in the opinion of the Executive Board, are necessarily incurred in connection with the work of the Agency. The income and property of the Agency shall be applied solely towards the promotion of the purpose of the Agency and no portion thereof shall be paid or transferred by way of dividend, share, bonus or otherwise by way of profit to the members of the Agency apart from the payment in good faith of reasonable and proper remuneration to any member of the Agency in return for services actually rendered.

(h) To do all such other things as are incidental or conducive to the attainment of the Purpose of the Agency.

ARTICLE V—Members

1. Categories of Membership

The Agency may have members in the following categories:

(a) National Delegates, that is persons nominated for appointment as national delegates in accordance with the procedure prescribed in Article VI (1) of this Constitution.

(b) International Delegates, that is persons nominated for appointment as international delegates in accordance with the procedure prescribed in Article VI (3) of this Constitution.

(c) Representative Members, that is persons nominated for appointment as their representatives by organizations which do not have the right to nominate national or international

delegates but to which the Executive Board or the General Assembly has accorded the right to nominate representative members.

(d) Ophthalmologists and Professional Members, that is individuals qualified as ophthalmologists or in some science or profession recognized by the Executive Board as appropriate for the purpose of according the status of professional membership.

(e) Honorary Members, that is individuals not exceeding fifty in number to whom the General Assembly has accorded the status of honorary membership either for life or for a stipulated period of years.

2. Financial Contributions

The General Assembly shall delegate to the Executive Board authority to determine the financial contributions appropriate to each category of membership.

ARTICLE VI—Delegates

1. National Delegates

National Delegates may be appointed from any country in which there exists a national committee or national organization (or any approved grouping of such committees and organizations) recognized by the Executive Board as entitled to appoint that country's national delegates. The Executive Board may withhold such recognition if it considers that the nominating committee, organization or group is insufficiently representative of the organizations and interests concerned with the prevention of blindness in that country.

2. Number of National Delegates

The number of national delegates which may be nominated for appointment from any country shall be related to the size of that country's population as revealed in the most recent national census. A country with a population not exceeding 5 million may appoint one delegate. A country with a population of more than 5 million but not exceeding 20 million may appoint 2 delegates. A country with a population of more than 20 million but not

exceeding 50 million may appoint 4 delegates. A country with a population of more than 50 million may appoint 6 delegates.

3. **International Delegates**
The Executive Board may authorize an international non-governmental organization to nominate a representative for appointment as an international delegate. Before according such right of nomination, the Executive Board shall be satisfied that the organization concerned is international in scope and that it promotes, operates or coordinates a substantial program for the prevention or cure of blindness.

ARTICLE VII – Commencement and Termination of Membership

1. **Commencement**
The Executive Board shall appoint a suitable person to act as Registrar and such Registrar shall maintain the register of all members of the Agency. All applications for membership shall be made in writing to the Registrar who, if satisfied that the applicant is qualified for membership in accordance with the provisions of Article V of this Constitution and that any appropriate financial contributions have been paid, shall enter the applicant's name in the register of members and the applicant shall thereupon assume the rights appropriate to the category of membership. Any person or organization whose application is refused by the Registrar or whose application is not proceeded with within three months, may appeal to the Executive Board or to a Committee of the Board authorized to consider such appeals and the decision of the Board or of such Committee shall be final.

2. **Termination**
A member's name shall be withdrawn from the register and membership shall cease if:
   (a) Membership is terminated by the organization or committee which nominated the member a delegate or representative member.
   (b) Membership is terminated by resolution of the Executive Board.

3. **The Register**
The Register of Members, or a true copy thereof, shall be kept at the Headquarters and shall be open to inspection during normal office hours by any member of the Agency.

ARTICLE VIII—The General Assembly

1. The first General Assembly shall be convened by the President not later than three years from the date on which the Agency comes into operation. Subsequent Assemblies shall be held at intervals not exceeding four years and at a time and place determined by the General Assembly or the Executive Board. The President, by giving two months' written notice to all members, may convene an Extraordinary General Assembly and shall convene such an Assembly if he is requested to do so by a majority of the members of the Executive Board or by a majority of the national and international delegates. General Assemblies shall, so far as possible, be held at a time and place likely to be convenient to a majority of the members having regard to the timing of other international conferences of ophthalmologists or of blind welfare workers.

2. **Function**
The General Assembly shall be the governing body of the Agency and its decisions shall determine the general policies by which the Agency shall seek to achieve its purpose. The General Assembly shall elect the officers and the Executive Board in accordance with the procedure prescribed in Article X and XI of this Constitution. It shall review the work of the Executive Board, approve the general report, accounts and budget of the Agency, and shall regulate the Agency's relationship with other organizations.

3. **Resolutions**
The General Assembly shall have the power to adopt special and general resolutions. A special resolution of the General Assembly is a resolution which concerns:
   (a) the amendment of the Constitution;
   (b) the number of members in each group of the Executive Board as prescribed in Article XI of this Constitution and

the election or appointment of members in Groups A, B, C, and E of the Executive Board;

(c) approval of the financial estimates of the Agency;

(d) the dissolution of the Agency.

A general resolution is a resolution which is concerned with any other business of the General Assembly. In the event of disagreement whether a resolution is special or general, the decision of the President or, in his absence, of the officer presiding as Chairman of the Assembly, shall be final. Except with the approval of the Executive Board, no special resolution shall be proposed in the General Assembly unless it has previously been submitted in writing to the President at least eight weeks before the commencement of the General Assembly.

ARTICLE IX—Votes in the General Assembly

1. **Votes on General Resolutions**
Every registered member of the Agency may attend and participate in the business of the General Assembly and may exercise one vote on any general resolution.

2. **Votes on Special Resolutions**
Only national delegates, international delegates and members of the Executive Board may vote on a special resolution as defined in Article VIII (3) of this Constitution.

3. **Limitation**
On any resolution not more than 15 percent of the votes shall be cast by members who are citizens of the same country. If in any General Assembly more than 15 percent of the members with voting rights are citizens of the same country, these members shall decide between themselves on the limitation of their voting rights in accordance with this Clause and should they fail to agree, the matter shall be decided by lot.

4. **Quorum**
At any General Assembly, 40 members shall constitute a quorum for the purpose of considering a general resolution and 30 members with voting rights on a special resolution shall constitute a quorum for the purpose of considering a special resolution.

5. All resolutions at a General Assembly shall be decided by a majority of the votes cast except for resolutions to amend the Constitution or dissolve the Agency, which shall be decided in accordance with the procedure prescribed in Article XIII and Article XIV of this Constitution. Voting may be viva voce, by show of hands or by ballot which may be secret if so decided by the President or, in his absence, by the officer presiding as Chairman of the Assembly. Unless otherwise decided by the General Assembly, the election of an officer of the Agency shall be by secret ballot. Between meetings of the General Assembly questions which, in the view of the Executive Board lie outside the powers committed to that Board, may be decided by postal ballot of all members qualified to vote on the question at issue.

6. **Proxies**
A national delegate who is unable to attend a session of the General Assembly may authorize another member of his national delegation to exercise a proxy vote on his behalf. Written notice of such proxy must be given to the President before the commencement of the session of the General Assembly at which such proxy vote will be exercised. No delegate shall exercise more than two proxy votes.

7. In the event of an equality of votes on any resolution the President or, in his absence, the officer presiding as Chairman of the Assembly, may exercise a second or casting vote.

ARTICLE X—Officers

1. The Officers of the Agency shall be: President, one or more Vice Presidents, Treasurer, and such other officers as may from time to time be appointed by special resolution of the General Assembly. If more than one Vice President is appointed, one of them shall be designated as the Senior Vice President.

2. Officers shall be elected by general resolution of the General Assembly from amongst the members elected or appointed at that Assembly as members of the Executive Board. The officers of the Agency shall hold office until the conclusion of the next

General Assembly when they shall retire from office but, subject to the provisions of Clause 3 of this Article with regard to the period of office of the President, shall be eligible for re-election.

3. The President, in cooperation with the Officers, shall give leadership in the activities of the Agency and in the formulation of its policy. The President shall have the right to preside at all meetings of the General Assembly and of the Executive Board. No person shall hold the office of President for a consecutive period exceeding eight years but, should this period elapse between meetings of the General Assembly, the President may continue in office on a temporary basis until the conclusion of the next General Assembly at which the new President shall be elected.

4. The Vice President, or should there be more than one Vice President, the Senior Vice President, shall act as assistant to the President and, in the President's absence, shall preside at meetings of the General Assembly and of the Executive Board. In the event of the incapacity, resignation or death of the President, the Senior Vice President shall assume the duties of the President pending the election of a new President by the General Assembly. If the President for the time being is not a qualified ophthalmologist, the Senior Vice President or other qualified officer designated by the Executive Board, shall act as the Agency's representative on the International Council of Ophthalmology.

5. The Treasurer and President shall undertake the duties appropriate to their respective offices and such additional duties as may be specified by the Executive Board or the President. In the event of disagreement about the duties of the respective Officers, the decision of the President shall be final.

6. The Officers, immediate past president, and Regional Chairmen collectively shall act, under the chairmanship of the President, as an Executive Committee of the Executive Board with power, between meetings of the Board, to make decisions necessary for the continuation and advancement of the work of the Agency and to undertake such additional duties as may be assigned to them by the Executive Board. Four ad hoc non-voting members

may be selected by the President from the Executive Board to serve at the discretion of the President.

ARTICLE XI—Executive Board

1. Each General Assembly shall elect an Executive Board whose members shall serve until the conclusion of the next General Assembly when they shall retire from office but be eligible for re-election.

2. The Executive Board shall consist of the following groups of members:

   Group A. Members appointed by special resolution on the nomination of the International Council of Ophthalmology to represent organizations concerned with ophthalmology and with the prevention of blindness.

   Group B. Members appointed by special resolution on the nomination of the World Blind Union to represent organizations for and of the blind.

   Group C. Members elected by special resolution to represent the national delegates appointed in accordance with the provisions of Article VI of this Constitution.

   Group D. Members elected by general resolution to represent scientific disciplines other than ophthalmology.

   Group E. Members appointed by special resolution on the nomination by the Partnership Committee of international non-governmental organizations to represent those organizations whose activities contribute to the attainment of the purpose of the Agency.

   Group F. Members elected by general resolution in recognition of the individual contribution which they can make to the work of the Agency.

3. Until otherwise determined by special resolution of the General Assembly, the maximum number of members in each of the Groups prescribed in Clause 2 of this Article, shall be:

   Group A: Five Group D: Four
   Group B: Five Group E: Ten
   Group C: Twelve Group F: Four

4. **Alternates**
For each member of the Executive Board, an alternate may be appointed who, on behalf of and at the request of the member, may attend and vote at any meeting of the Board from which the member is absent. Each alternate shall be appointed by the same procedure as that described in Clause 2 of this Article for the appointment or election of the member whose alternate he is. No alternate shall perform any of the duties of an Officer.

5. **Vacancies**
Between General Assemblies, any member of the Executive Board who vacates office shall be succeeded by the alternate and the Executive Board shall thereupon appoint another suitable person to serve as alternate. In the event of the incapacity, resignation or death of an Officer other than the President, the Executive Board may appoint one of its members to perform the duties of the vacant office until the next meeting of the General Assembly.

ARTICLE XII—Powers of the Executive Board

1. The Executive Board shall be responsible for interpreting the decisions and policies adopted by the General Assembly. It shall administer, manage and control the affairs, finances and property of the Agency and in so doing shall be authorized to take any action not specifically reserved for the General Assembly. It shall supervise the activity of the Officers and employees of the Agency and shall have the right at all times to receive reports on their activity.

2. The Executive Board shall decide on the time and place of its meetings which shall be held at least once every two years. At any meeting of the Board, a quorum shall consist of half the members for the time being of the Board or eight members, whichever number is least. An alternate attending a meeting on behalf of a member, shall count as a member for the purpose of the quorum.

3. The Executive Board may decide on any matter within its competence by:

(a) The agreement of a majority of the members present at a meeting at which there is a quorum as defined in Clause 2 of this Article.

(b) The agreement of a majority of the members voting in a postal ballot which has been circulated to all members at least six weeks before the votes are counted and in which votes are recorded by not fewer than half the members of the Executive Board or by eight members, whichever is least.

In the event of an equality of votes, the President or officer presiding as Chairman of the Executive Board may have a second or casting vote.

4. Committees

The Executive Board may appoint Committees for any purpose with such terms of reference and duties as it may decide. Such Committees shall consist of members of the Agency but non-members may be co-opted in a consultative or advisory capacity.

5. Financial Control

It shall be the duty of the Executive Board to ensure the maintenance of an efficient system of accountancy and financial control and at all times to cause expenditure to be regulated within the income and resources of the Agency. The accounts and balance sheet of the Agency shall be audited annually by a professionally qualified auditor and copies of the accounts and balance sheet together with a report on the activities of the Agency, shall be made available annually to all registered members of the Agency and to any authorities entitled to receive such accounts and reports.

6. Nominations

At the time of the General Assembly, the Executive Board shall be entitled to propose, for the consideration of the Assembly or of any nominations committee appointed by the Assembly, the names of persons it considers suitable for nomination as officers or as members of the Executive Board. These nominations shall in no way limit the freedom of choice of the Assembly.

ARTICLE XIII—Constitutional Amendments

1. This Constitution may be amended:
   (a) By a special resolution of the General Assembly (as defined in Article VIII (3) of this Constitution), adopted by a majority of not less than two thirds of the members present and voting on the resolution.
   (b) With the consent of the Executive Board by a postal ballot of all members entitled to vote on a special resolution provided that not less than two thirds of the votes cast are in favor of the proposed amendment.

2. A Constitutional amendment may be proposed by the Executive Board or by not less than five members of the Agency. Any amendment proposed for consideration by the General Assembly shall be submitted in writing to the Secretary-General at least three months before the commencement of the General Assembly at which the amendment is to be considered.

ARTICLE XIV—Dissolution

The dissolution of the Agency shall require a special resolution of the General Assembly proposed by the Executive Board and adopted by a majority of not less than two thirds of the members present and voting on the resolution. In the event of bankruptcy and subject to any laws applicable to the Agency, the personal liability of any member of the Agency shall be limited to a maximum of $10. On the dissolution of the Agency, any remaining assets shall be disposed of in accordance with the recognized legal procedure of the country in which such assets are owned.

Appendix E

IAPB Membership Criteria

The following are membership criteria for national and international organizations that wish to join the International Agency for the Prevention of Blindness. Such an organization must:

1. Be a formally organized national or international non-governmental organization operating with a constitution and by-laws and governed by a board of directors with representation from the professions related to prevention of blindness and nonprofessional representatives from corporations, banking, the legal field, fraternal organizations, women's groups, etc.
2. Have a corps of voting members to elect the board of directors.
3. Have appropriate financial management and controls and an annual budget related to program expenditures.
4. Operate a program with the goal of preventing blindness among all ages and in all areas of service through research in causes of blindness and impaired vision, public and professional education and community services, i.e., vision testing and correction, cataract treatment, glaucoma detection, eye safety, control of diseases such as onchocerciasis, ophthalmic neonatorum, and general disease infections.
5. Employ a paid staff qualified to plan and execute a program.
6. Produce an annual report and financial statement.
7. Serve as an advocate of the prevention of blindness activities of government agencies.
8. Accept responsibility for providing financial support to IAPB.

Information to be supplied on application form:

Name of Organization
Address
Date founded
Names and addresses of officers
Names and addresses of governing board
Number of voting members

The following must also be submitted with the application:

1. Copy of Constitution and by-laws,
2. Copy of financial statement and budget,
3. List of sources of funds (government and non-government) and amount by source,
4. Brief description of program, and
5. Annual report.

Send this information to:

Mr. Alan W. Johns
IAPB Secretariat
P. O. Box 191
Haywards Heath
West Sussex RH16 4YF
United Kingdom

Appendix F

A Brief Overview of the Global Program for the Prevention of Blindness

by Carl Kupfer, M.D.

THE WORLDWIDE PROBLEM OF AVOIDABLE BLINDNESS

Although excellent ophthalmic procedures and eye-care delivery systems are accessible in the developed world, adequate health care is not readily available in all parts of the developing world. This widening gap in visual health between developed and developing nations threatens to have ominous consequences. If present trends continue, the number of blind people—today estimated at 27–35 million—will more than quadruple during the next 40 years.* Tragically, as many as 90 percent of these blind people will live in developing countries.

The difficulty of adequate eye-care delivery can be exemplified by experiences in India and China. Over the past 10 years in India, the number of annual cataract operations has grown from 0.5 to 1.2 million. However, there are 3.8 million new cases each year. Therefore, 3 times as many cataract operations are needed each year in India just to keep up with the new cases, whilst no progress is being made to reduce the backlog of some 7 million blind. Surveys carried out in China in 1984–85, have estimated that there are 5 million blind people, of whom perhaps 3 million have unoperated cataracts. In response to these estimates, a national program was formulated in 1986. Since then, more than 20 provinces have identified pilot counties in which to launch programs of primary eye

*The definition of blindness used here, unless stated otherwise, is corrected visual acuity less than 3/60 (20/400) in the better eye, which is the internationally-accepted definition of blindness and indicates the inability to count fingers at a distance of three meters or to walk around unguided. Severe visual impairment is defined as visual acuity in the better eye equal to or less than 6/60 (20/200) to 3/60.

care that include the goal of providing mass intervention for cataract. Although at the start of this Chinese national program there were only 50,000 cataract operations annually, the Ministry of Health has set the goal of 500,000 operations per year to be reached by 1992. In addition, the training of ophthalmologists has been given very high priority.

Designing and funding delivery systems to handle such large increases in places like India and China would challenge any developed country, but in the developing world the needed response will be even greater. The population 55 years of age and over in the developing world will increase by almost 500 percent in the next 40 years, with a concomitant increase in all of the blinding conditions related to aging.

This large-scale disablement caused by blindness is not only a costly obstacle to economic development, it is a catastrophic loss of human potential in the very parts of the world most desperately in need of a healthy work force. In addition, because more than 80 percent of all cases of blindness can be considered avoidable—that is, they could have been prevented or could be cured using available and locally appropriate technology—such deprivation is a truly needless denial of a basic human right for millions and millions of people.

The problem in most developing countries lies not in the ability of ophthalmic workers to diagnose properly, but rather in the inability of national health-care systems to provide appropriate therapy. Effective programs for preventing and curing blindness in these countries will require the development of an infrastructure to deliver mass treatment at low cost. The appropriate technology for such situations will depend upon what is acceptable within the existing culture. If the therapy is rejected or if it is too complicated or expensive, it could postpone or preclude the implementation of less elaborate but more effective procedures.

ACHIEVEMENTS OF THE GLOBAL PROGRAM FOR THE PREVENTION OF BLINDNESS DURING THE PAST 10 YEARS

The achievements of the global program for the prevention of blindness have depended upon the creation of the World Health Organization (WHO) Prevention of Blindness Program, the establishment

of national prevention of blindness committees, and the strengthening and cooperation of the international non-governmental organizations (NGOs) involved in prevention of blindness programs. The overall coordination of these activities has been facilitated by the International Agency for the Prevention of Blindness (IAPB).

The IAPB is an international non-governmental agency founded by Sir John Wilson in 1975 to lead a cooperative universal offensive to reduce drastically the world's avoidable blindness. The establishment of this global prevention of blindness program has effectively enabled the participating organizations to speak with one voice to the world regarding prevention of blindness issues since 1975. The IAPB does not raise funds, but rather depends upon dues from its constituent NGOs to support its modest annual budget of about $100,000.

Because the WHO Program cannot help a nation establish a blindness prevention program until it has been officially invited to do so by that nation's government, the IAPB promotes awareness of the existence of the WHO's Program and encourages the development of national prevention of blindness committees in countries where they do not already exist. Such a committee can then work with that nation's Ministry of Health to prepare the invitation and subsequently work with WHO to appraise the situation and design an appropriate program. The NGOs are often able to help fund the projects identified by the WHO team.

The prevention of blindness community's perception of the importance of coordinating its activities was heightened at the World Health Assembly in Geneva in 1985. At that meeting the major technical discussions focused on the need for increased collaboration between the WHO and NGOs. The IAPB exhibit and presentation at that Assembly received considerable attention from the delegates because we demonstrated how well WHO, individual NGOs, and national committees had interacted in designing and operating prevention of blindness programs in Latin America, Asia, and Africa.

The principal goal of IAPB is to control the four major diseases that cause more than two thirds of all blindness in the developing world: cataract, trachoma, onchocerciasis, and xerophthalmia. Over the past decade, this consortium of NGOs and national committees in over 60 countries has directed efforts toward mobilizing resources, increasing public awareness, supporting sight-conservation

programs, and implementing WHO health-care strategies aimed at arresting the ravages of these diseases.

Other major coordinative activities of the IAPB include the General Assemblies held every four years. At these Assemblies over 400 major players in the prevention of blindness field— often from as many as 60 countries worldwide—meet, make formal presentations describing successful programs, compare notes regarding obstacles that must be overcome, and prepare revised strategies for their next four years of effort.

The IAPB is represented at regional WHO meetings and helps encourage WHO prevention of blindness activities in the developing world. The IAPB also holds regional IAPB meetings periodically (its regional structure matches that of WHO). The IAPB occasionally co-sponsors workshops to develop priority programs. One important recent workshop helped establish the concept of Cataract-Free Zones and another applied the principles of operations research to overcoming barriers to cataract surgery. A third has resulted in a clinical trial to be conducted in two developing countries to assess the cost-effectiveness, efficacy, and safety of cataract surgery using the intraocular lenses as compared with using aphakic spectacles to provide optical correction after removal of the lens. The IAPB, in conjunction with the National Eye Institute of the National Institutes of Health in Bethesda, Maryland, also coordinates symposia and seminars on prevention of blindness topics, often in conjunction with major international meetings such as those of the International Council of Ophthalmology.

The IAPB also functions as a clearing house, facilitating the dissemination of information among the organizations and committees concerned with prevention of blindness through its publication of the *IAPB News*, which is mailed twice a year to 4,500 eye-care professionals in 148 countries.

An encouraging trend fostered by IAPB has been that prevention of blindness programs have become increasingly innovative. We are continually finding new forms of intervention that are low in cost, safe, and highly effective. As an example, I would point to the evolution of the programs to prevent xerophthalmia by increasing vitamin A intake. Initially, all these programs were based on supplementation by means of vitamin A in capsules or solutions, and that remains a feature of most of these programs. But new approaches have also emerged. One of these is fortification

of locally consumed foods, which makes it possible to achieve rapid and widespread distribution of vitamin A.

Another innovative strategy, which may be even more promising in the long run, is the educational approach that teaches mothers to use in the family diet naturally occurring sources of vitamin A from the local environment. Where education succeeds, people will be safe from vitamin A deficiency for generations. That is an enormous impact, and it can be realized through a program that in the long run is relatively low in cost.

In addition, our awareness of the problem of cataract has increased over the past decade. In 1975 we were alert to the dangers posed by infectious diseases such as trachoma and onchocerciasis, but we were less aware of cataract as a cause of avoidable blindness. Now, as a result of surveys and careful re-examination of our patient populations, we now know that cataract is the major cause of avoidable blindness in almost all regions of the developing world. Therefore, because cataract is responsible for over one half of the world's avoidable blindness, we must adjust our priorities accordingly.

Also, because of all the advances I have mentioned and our new knowledge about the causes and distribution of blindness, we are better equipped than ever to demonstrate the value of programs for the prevention of blindness. We can document the reduction in prevalence of blindness and the concomitant cost-effectiveness of these efforts. This gives us an even better chance of attracting the resources needed to support large-scale programs to combat blindness.

WHO PROGRAM FOR THE PREVENTION OF BLINDNESS

Since 1978, the worldwide focal point for development of prevention of blindness programs has been the WHO Program for the Prevention of Blindness, which for the past decade has been very capably directed by Dr. Bjorn Thylefors.

The Program has undertaken the development of an agenda for the promotion and coordination of national programs for the prevention of blindness. In fulfilling this responsibility, the Program includes the following:

1. Overall planning and coordination for the implementation and evaluation of national programs;

2. Identification of needs and stimulation of contributions;
3. Coordination of activities relating to the prevention of blindness undertaken by other international, governmental, and NGOs and bilateral technical-assistance programs;
4. Stimulation and coordination of research required to meet the needs of national programs;
5. Collection and dissemination of relevant information; and
6. Promotion of training of required personnel at all levels.

Typically, WHO will conduct a prevalence survey to establish the extent of the problem of blindness in a given country. Recent WHO prevalence surveys have been conducted in the People's Republic of the Congo, the Republic of Turkey, and Nepal. Such a survey will provide an objective assessment of the major needs and opportunities that must be addressed in planning that country's prevention of blindness program. Using the information contained in such a research base, individual international NGOs will be able to judge if they have the right mix of programmatic interest, available funds, and managerial talent to undertake a prevention of blindness project in that country.

For example, after the prevalence survey was completed in Nepal, the Nepalese government, WHO, and the local prevention of blindness organization Nepal Netra Jyoti Sangh were joined by three charitable organizations from within Nepal and ten international NGOs who divided the country into manageable sections. Within six years the number of patients receiving outpatient examinations and treatment annually increased from 2,700 to 265,608, and the number undergoing cataract surgery annually increased from less than 500 to 14,833.

Mechanisms for implementation of the WHO Program include the establishment of a network of 14 WHO Collaborating Centers worldwide for the Prevention of Blindness and consultation with various program advisory groups and with members of relevant WHO expert panels. Several of the WHO Collaborating Centers have developed courses in community ophthalmology and have sponsored research projects dealing with delivery of eye care using appropriate technology.

Although the primary role of the WHO is that of promoter or catalyst of technical cooperation and collaboration among developing countries, there are several additional ways in which WHO may

provide other critical inputs, depending upon circumstances and subject to requests from national authorities.

The following are examples of such activities:

1. Assessment of the nature and extent of the problem (through national prevalence surveys);
2. Formulation of national or regional plans, programs, and projects (in 70 countries in 1991);
3. Collection, elaboration, and distribution of relevant data (through the global data bank);
4. Organization and management of training activities such as seminars, meetings, and training courses—including the preparation and provision of teaching aids (for example vitamin A deficiency primary eye-care posters);
5. Procurement of essential supplies and equipment (for example cataract instruments for Laos and Vietnam); and
6. Advisory services by staff members or by short-term consultants, and possibly by personnel assigned for longer periods.

It is particularly heartening to see how much the WHO Prevention of Blindness Program has grown. When it was established in 1978, the Program had no separate budget. In 1980, when it was first assigned funds of its own by WHO, the Program was given $1.3 million for two years of operations. However, just a few years later, for the 1984–85 biennium, the budget had almost doubled to $2.3 million per year. For the current biennium of 1990–91 the regular budget for the Program is over $2.4 million, plus extra-budgetary funds of $1.6 million. Such extra-budgetary funding has come from a variety of sources, including the Japan Shipbuilding Industry Foundation, the Arab Gulf Fund for the United Nations Development Organization (also known as AGFUND), and the United Nations Development Program (UNDP).

The global program has drawn attention to the issue of blindness prevention, and it has stimulated more action in the field, both in professional-scientific contexts and in administrative-political circumstances. Much of this promotional work has been done in close collaboration with WHO and IAPB and its member NGOs.

Another major achievement of the global program has been the successful development of a primary health-care approach to the prevention of blindness. The concept of primary eye care as a

cornerstone of primary health care has become not only important in the development of national programs but crucial for the NGOs' support to those programs. Although primary eye care is today a universally accepted strategy for blindness prevention, this concept would have been very difficult to achieve without the WHO Program and the input from IAPB and the other NGOs.

The need for technical guidance within national programs that are attempting intervention schemes against major causes of blindness has resulted in increased program documentation. Particularly noteworthy are strategies for national cataract reduction programs, WHO publications in areas such as trachoma and xerophthalmia control, control of conjunctivitis in the newborn, and the provision of spectacles at low cost. In addition, there have been important developments in writing and distributing training materials in eye care.

Using population-based surveys, the global program has also developed a uniform simple methodology for assessing avoidable blindness. Using today's commonly accepted international definitions of blindness and visual impairment, this methodology has greatly improved the availability of epidemiologically sound and comparable data on blindness and its causes from various countries. Much of this work has been supported by the National Eye Institute, which has funded field surveys in several countries to test examination procedures and record keeping.

A global data bank on blindness was established within the WHO Program from its outset. This data bank is continuously being revised and updated; it contains at present over 150 references from 90 countries. The first compilation of all available data was the subject of a Task Force in 1978, which produced a report estimating the number of blind in the world to be about 28 million. A second comprehensive compilation and analysis of data was carried out in 1987 and provided an estimate of 27 to 35 million blind persons worldwide.

In the field of applied research, the WHO Program has extensively used its network of Collaborating Centers. In spite of initially very limited financial resources, a wide range of research tasks has been completed, covering specific aspects of disease control or training of personnel. Again, the National Eye Institute has provided much valuable support to the research component of the Program over these years.

Another important activity of some of the WHO Collaborating

Centers has been the establishment of training courses in public health aspects of ophthalmology. These courses are creating a cadre of national program managers who will be of great importance in the implementation of national programs.

Non-governmental Organizations generate the resources to support prevention of blindness programs

The major NGOs include Christoffel-Blindenmission (Germany), Foresight (Australia), Helen Keller International, the International Eye Foundation, and Seva (USA), Operation Eyesight Universal (Canada), Sight Savers or the Royal Commonwealth Society for the Blind (UK), and the Organisation pour la Prévention de la Cécité (France). Since the establishment of the WHO Prevention of Blindness Program, these NGOs in the field who have been invited to send observers to the biennial meetings of the 12-member WHO Prevention of Blindness Program Advisory Group, which is appointed by the WHO Director-General. However, to facilitate further development and coordination of activities, in 1986 the WHO established the Consultative Group of NGOs to the WHO Prevention of Blindness Program.

The purpose of the Consultative Group, which meets in the years when the Program Advisory Group does not meet, is to provide an opportunity for communication between WHO and interested NGOs regarding particular projects or needs in selected countries where the WHO Program does not have the required resources to intervene but where NGOs have good working channels. Through such cooperation with the WHO Program, the NGOs have provided valuable help to WHO, including support to staff in the WHO regions, funding for joint meetings, and promotion of selected national blindness programs. In return, the WHO has facilitated where possible the introduction of NGOs to Ministers of Health in countries receptive to the development of programs.

Another NGO committee is called the Partnership. The purpose of this group, which meets periodically, is to coordinate activities between NGOs that are working in the same countries or regions.

Concomitant with the substantial increases in WHO funding, there has been a parallel growth in the resources of the NGOs that are such an important part of blindness prevention and of the IAPB. In 1991 the major NGOs in the field plan to expend about

$60 million on blindness prevention and related activities. The comparable figure for 1975 was only $6 million.

This growth means that these organizations now command the resources to support sizeable programs that have a highly noticeable impact. The extensive cataract surgery programs throughout Asia and Africa sponsored by Sight Savers, Christoffel-Blindenmission, Operation Eyesight Universal, and the Seva Foundation constitute one example. The massive vitamin A supplementation programs begun by Helen Keller International are another. The programs for training allied health personnel sponsored by the International Eye Foundation are a third. There is every reason to believe that the growth in resources that makes such programs possible will continue in the future.

National Programs for the Prevention of Blindness

The global program for the prevention of blindness has been very successful in developing national programs for the prevention of blindness. Over 60 countries have collaborated with WHO and IAPB in the preliminary assessment of blindness and its causes, the preparation of national plans, and the implementation or evaluation of programs. Some of these national programs were in existence well before the creation of the WHO Program and the IAPB, but at that time mainly as specific trachoma control programs. These programs have been gradually expanded to incorporate other causes of visual loss and have been used to establish broad-based national prevention of blindness programs and to integrate them within the framework of each country's primary health care.

ACHIEVABLE AND SUSTAINABLE PROGRAM TARGETS TO THE YEAR 2000

To mobilize the resources needed to prevent needless loss of vision—80 percent of the blindness in the world is avoidable—the prevention of blindness community must implement a global strategy aimed at: 1) increasing public and governmental awareness of the extent of the problem, 2) encouraging decision-makers to allocate funds and staff support for relevant programs, 3) developing effective programs in countries that currently lack them, and 4) increasing the effectiveness of programs already in existence.

If the global program for the prevention of blindness is to make progress in achieving these objectives by the year 2000, it must secure broader support for its activities immediately. This requires further improving the flow of information among the many individuals and groups concerned with blindness prevention and to facilitate additional cooperation between WHO, UNICEF, UNDP, bilateral aid agencies, the major NGOs involved in international blindness prevention, and the national committees of the IAPB. The IAPB, by serving as a clearinghouse for ideas and information on successful approaches to blindness prevention, and by helping to match available resources with promising programs that require assistance, can do much to ensure efficient use of the resources now available for blindness prevention.

Strengthening the national committees, both in their dealings with international organizations and in their home countries, is another priority for the next decade. This can be accomplished in three ways. First, contact between these national committees and the IAPB leadership should be increased. Second, a greater effort should be made to acquaint national committees with the international NGOs that may be able to assist them in meeting their blindness prevention goals. And third, it is necessary to improve communication among the various national committees and to encourage the exchange of ideas and experiences among them.

The international prevention of blindness program must broaden its base of support and develop a strong grass-roots constituency if it is to continue to make progress in the years to come. The new SightFirst Program of Lions Clubs International promises to be an example of how to harness such broad-based support. Because there are over 1.3 million Lions in 171 countries, this new program is likely to become an important resource in the international battle against preventable and curable blindness. To broaden our international base of support eye-care professionals, the general public, health-related associations, government officials, and charitable organizations around the world must become acquainted with our prevention of blindness efforts and our aims. In addition, they must be persuaded to help. Ophthalmological societies have already been identified as a key target of any effort to increase grass-roots support. With stronger support from the world's ophthalmologists, the program will be in a better position to approach governmental decision-makers and NGOs who can provide invaluable support for the international campaign against blinding eye diseases. Ophthalmol-

ogists can also be highly persuasive in bringing the problems of world blindness to the attention of the general public in their own countries, thus generating additional support.

In addition to the above, a greater effort must be made to identify prevention of blindness programs that are particularly worthy of increased support, so that we can present persuasive arguments to decision-makers, particularly those in NGOs who arrange funding. To accomplish this, we must have more reliable information on the programs now in existence and on the needs that future programs must address.

There is no doubt that the growing problem of cataract will need to receive priority attention in most countries. It will require great effort to make cataract surgery available and to provide appropriate optical correction to all those in need of it. There is already a large backlog of unoperated cataract in many developing countries. The elimination of such a backlog, and keeping pace with the ever-increasing demand for surgery, will pose many problems for the eye-care systems in countries with meager resources.

To address problems such as this enormous backlog of cataract cases, relevant management courses will be instituted in English at the Aravind Eye Hospital in Madurai, India, and in French at the Institut d'Ophtalmologie tropicale de l'Afrique, the WHO Collaborating Centre in Bamako, Mali. The latter institute will also conduct a study in ways of improving cataract outpatient surgery in Africa.

In addition, there will be an ophthalmic manpower training center developed in Malawi and the National Eye Institute, as a WHO Collaborating Center, with the IAPB will offer a course in operations research for managers of eye hospitals, clinics, and research facilities in the developing world.

LESSONS TO BE LEARNED FROM THE PREVENTION OF BLINDNESS PROGRAM

The limiting factor in the prevention of blindness program is not simply money but the availability of well-organized and well-managed projects that have a high probability of success. Such projects will attract funding, but there remains the challenge of having available: 1) the necessary leadership in prevention of blindness,

2) the experience in managing such programs, and 3) the ability to evaluate the outcome.

Leadership refers to making the right choices, such as choosing the right programmatic direction and the right priority judgements. However, after the right choice has been made, it is the manager of the program who must see to it that the right choices are implemented efficiently. Whereas leadership involves aligning people toward a common vision and stimulating their desire to achieve it, management is concerned with the details of project staffing, mobilizing necessary resources, and attending to the many details necessary to do the job well.

This concept of using properly trained managers should be incorporated into the process of creating self-sustaining programs. In addition, it is necessary to set priorities regarding the allocation of scarce resources. It is better to use resources effectively and efficiently to do a few projects well than to spread the same resources over many projects in a restricted and inadequate manner.

One must also be concerned with the quality of the outcome of the project. The outcome should represent excellence in achieving the stated objectives. Evaluation will tell you whether you have delivered a quality service with constituent satisfaction. You should not settle for less.

Finally, and most important, at all times we must maintain a customer-oriented service mentality. In a sense, those who are disabled are like hostages. They are held hostage to their disability and are held hostage to those of us who can help relieve their affliction. Often they have few, if any, options in their quest for a better life. Accordingly, we must be especially conscious of the humanitarian aspect of our actions. This feeling for humanity must pervade our thinking, our planning, and our actions.

This brief overview was developed from materials written by Mr. Alan W. Johns, Dr. Bjorn Thylefors, Sir John Wilson, and the author.

Appendix G

A Brief Review of Milestones in the Global Program for the Prevention of Blindness

Compiled by Terrence Gillen

1882 London Society for the Prevention of Blindness is established and begins focusing attention on the causes and prevention of blindness at an International Congress of Hygiene in Geneva. Interest in preventing blindness continues sporadically over the next several decades.

1908 Christoffel-Blindenmission (CBM) is founded in Germany to provide education and rehabilitation of blind and other disabled people.

The National Society to Prevent Blindness (NSPB) is founded in the United States.

1915 The Permanent Blind Relief War Fund for Soldiers and Sailors of the Allies, Inc. is founded in Paris to aid blind Belgian soldiers and British war blind and to educate blinded French veterans. It evolves into the American Braille Press for War and Civilian Blind, Inc. (which produced 19 million pages of braille by 1927); the American Foundation for Overseas Blind, Inc.; and finally in 1977 Helen Keller International.

1929 Twenty-eight nations are represented at an assembly at The Hague where ophthalmologists from Europe and the United States and the League des Societies de la Croix Rouge found the International Association for the Prevention of Blindness. Prof. de Lapersonne (France) and Dr. Park Lewis (USA) are

elected President and Vice President. During its early years, the Association's General Assembly is held in conjunction with the International Congress of Ophthalmology (ICO), generally with a half day devoted to the prevention of blindness. The Association introduces the *Journal of Social Ophthalmology*, in French and English; 38 editions of this Journal are published until it is discontinued in 1967.

The International Organization Against Trachoma is founded in France.

1930 President Herbert Hoover invites 50 countries to participate in the World Conference on Work for the Blind, which is held in 1931 in Washington, D.C.

1947 British Government's Colonial Office White Paper addresses the general impression that there are an estimated 5 million blind people in the world, of whom 2 million live in India.

1948 World Health Organization (WHO) is founded, but at first there are no specific activities in the field of blindness prevention. Trachoma is the first blinding disease to which WHO directs its attention; WHO initiates the gradual development of surveillance and control methodologies and research and field studies from the early 1950s. Mass treatment programs are subsequently successful in providing topical treatment with tetracycline, health education, and surgical correction of trichiasis. Some of these field research studies are developed into national trachoma control programs in many developing countries in the 1950s and are the antecedents of today's comprehensive national programs for the prevention of blindness.

1950 British Empire Society for the Blind (subsequently called the Royal Commonwealth Society for the Blind) is founded in the United Kingdom and begins blindness surveys in Nigeria, Ghana, Sierra Leone, and in East and Central Africa. These surveys, which demonstrate a much greater prevalence than had been estimated, lead to a growing recognition of the magnitude of the problem and the need for making prevention a priority.

1952 WHO convenes an Expert Committee on Trachoma. Subsequent meetings are held in 1955 and 1961, and a Scientific Group meets in 1965.

From 1952 through 1956 two teams, one ophthalmic and one entomological, appointed by the Royal Commonwealth Society for the Blind, survey the extent and consequences of onchocerciasis in West Africa and propose a control program.

1960 The Association begins scheduling its General Assemblies to coincide with meetings of the newly formed European Congress of Ophthalmology. Sir Stuart Duke-Elder and Sir John Wilson propose cooperation between ophthalmologists and blind welfare workers.

The Association agrees to work with WHO on a World Health Day for the prevention of blindness, scheduled for April 7, 1962.

1961 The International Eye Foundation is founded in the United States by John Harry King, Jr., M.D., whose primary purpose is teaching with a mandate of the prevention and cure of blindness worldwide.

Christoffel-Blindenmission's services are extended to include ophthalmological work, particularly curing and preventing blindness.

1962 As Director of the Royal Commonwealth Society for the Blind and chairman of the Committee for the Prevention of Blindness of the World Council for the Welfare of the Blind (WCWB), Sir John Wilson proposes a fusion between the Committee and the Association for the Prevention of Blindness. Although these organizations remain independent, a Joint Committee is formed.

1963 Operation Eyesight Universal is founded in Canada.

1964 First meeting of Joint Committee in Geneva.

Adoption of an international system for classifying the causes of blindness. This system is recommended for use worldwide by the Association and is subsequently published in the *Journal of Social Ophthalmology* and is widely distributed.

1968 Although reporting of results is confused by different definitions of blindness and its causes, it is increasingly clear that besides trachoma there are several important blinding diseases commonly found in developing countries.

1971 Prof. Michaelson arranges a seminar on blindness prevention in Jerusalem. The Executive Committee of the Association proposes expanding its General Assembly at the forthcoming International Congress of Ophthalmology to a two-day Conference on Blindness and Visual Impairment.

The American Foundation for Overseas Blind (AFOB) provides assistance to 103 countries, and teachers from 15 nations attend orientation and mobility courses for educators. With a new emphasis on blindness prevention, AFOB begins a worldwide campaign to prevent nutritional blindness.

1972 Following a request from the World Health Assembly, WHO carries out a systematic inventory of available data on blindness and reports that there are between 10 and 15 million blind people in the world.

A Study Group on the Prevention of Blindness is convened to assess the magnitude of the problem and elaborate upon the definitions of visual impairment and blindness (that are used internationally to this day).

Vitamin A capsule distribution programs begin with launching of initiatives in Indonesia and El Salvador.

1974 At ICO meeting in Paris, changes to broaden the base of the Association are considered. WHO indicates the need for a single international agency uniting the many groups working in the prevention of blindness field. After consultations between leaders of the Association and the WCWB, a plan to restructure the organization is developed to make it more effective in global blindness prevention. Sir John Wilson (United Kingdom) is elected President and an executive committee is authorized to amend the Association's constitution. The proposed changes are subsequently adopted.

1975 A resolution is passed by the World Health Assembly request-

ing the Director General to enlist support of member governments in developing resources to prevent blindness and in setting up an advisory group.

The World Health Assembly adopts a resolution requesting the Director-General to take action against the problem of blindness and to establish initiatives against trachoma, xerophthalmia, cataract, onchocerciasis, ocular trauma, and glaucoma. This resolution was to be the basis for the establishment of the WHO Program for the Prevention of Blindness in 1978.

With the encouragement of WHO, the Association is transformed into the International Agency for the Prevention of Blindness (IAPB) on January 1. The IAPB's charge is to lead a cooperative universal offensive to reduce drastically the world's avoidable blindness by controlling major blinding diseases. The first priority of IAPB is the establishment of national prevention of blindness committees. Since its founding, the IAPB as a consortium of non-governmental organizations (NGOs) and national committees within more than 60 countries has directed efforts toward mobilizing resources, increasing public awareness, supporting sight conservation programs, and implementing WHO health-care strategies aimed at blinding diseases.

The Onchocerciasis (River Blindness) Control Program (OCP) is launched in originally 7 (and later 11) West African countries with WHO as executive agency and support from the Food and Agriculture Organization, the United Nations Development Program, the World Bank, and a number of donor countries.

A survey on nutritional blindness in Haiti determines that xerophthalmia is the leading cause of blindness in Haitian children.

1976 WHO inter-regional meeting in Baghdad stimulates worldwide interest in the control of major causes of blindness. At this meeting are 27 participants from 21 countries, 27 observers, 12 representatives of NGOs (most of which are affiliated with the IAPB), 7 WHO temporary advisors, and 7 WHO staff members. This largest gathering of experts on the prevention

of blindness ever assembled up to that time establishes strategies for manpower requirements and the development of eye-health services.

The theme of World Health Day on April 7 is "Foresight Prevents Blindness."

The National Program for the Control of Blindness is launched in India—the first-ever comprehensive nationwide program for the prevention and control of blindness, and a forerunner of similar developments around the world.

1978 WHO Program for the Prevention of Blindness is officially established in Geneva. The first advisory meeting on program development initiates a number of task-force meetings on specific issues, including data on blindness, manpower development, economics of blindness prevention, primary eye care, and national program development.

WHO Task Force estimates that (according to which definition of blindness is adopted) there are probably 28 to 42 million blind people in the world.

Seva Foundation is founded in the United States to apply lessons learned through smallpox eradication to alleviate suffering due to other public health problems. Blindness prevention in Nepal is adopted as primary focus of program activity.

The First General Assembly of the IAPB is held in Oxford, United Kingdom, where 170 representatives from 44 nations convene for a three-day conference. Because it is already well known that mankind has the ability to significantly curtail the majority of the world's blinding eye diseases and prevent at least half of all blindness through well-planned sight conservation programs using available resources and medical knowledge, the theme of the Assembly is "Mobilizing Resources." Representatives of the world's blind population, organizations concerned with their welfare, government officials, ophthalmologists, and experts in vision science and other scientific disciplines evaluate the state of knowledge in each major area of visual disability and blindness and examine the possibilities for treatment and prevention. Prospects for greatly increased blindness prevention activities are studied

in relation to regional needs, thus enabling the participants to return to their homes resolved to stimulate governmental and inter-governmental action.

1979 WHO Director-General establishes a WHO Program Advisory Group (PAG) on the prevention of blindness. Subsequent PAG meetings successfully evaluate progress made in the Program and coordinate work with the collaborating NGOs.

Foresight (Australian Overseas Aid and Prevention of Blindness, Ltd.) is founded in Australia.

WHO Task Force meets in Bethesda, Maryland.

1980 Second PAG meets in Ouagadougou and adopts recommendations of WHO Task Force meeting in Bethesda.

A network of 10 WHO Collaborating Centers for research and training in the prevention of blindness are identified over the first two years of the Program and agreements for designation of those centers are elaborated. Another four centers have subsequently been included in this network.

1981 An international conference at Leeds Castle, England, formulates global strategies for the prevention of disability leading to the formulation by three United Nations agencies of the International Initiative Against Avoidable Disablement, now known as the IMPACT program.

First nationwide probability sample-based survey of blindness is carried out in Nepal with the cooperation of WHO, the government of the Netherlands, Seva Foundation, the Norwegian Agency for International Development, and other participating agencies. Results from the survey give the first indication that cataract accounts for two thirds of Nepal's blindness. This survey forms the basis for the first five-year plan for the Nepal Blindness Program.

1982 The Second General Assembly of the IAPB is held in Bethesda. This meeting of 300 people representing more than 50 countries is by far the largest international gathering of experts on blindness prevention ever convened to that time. The theme "New Horizons in Sight" reflects the fact that

IAPB's earliest goal—the creation of national committees for the prevention of blindness—had been almost fully achieved and that many of these committees had been successful in initiating national sight-conservation programs. Participants at this Assembly look for new horizons by discussing several ongoing or recently completed blindness prevention projects, assessing their results, and establishing the ones that are most successful as models for future efforts. This Assembly also conveys the message that well-designed blindness prevention programs—particularly those that draw exclusively on local resources—can be highly effective even when judged by economic as well as medical criteria. Dr. Carl Kupfer (USA) is elected President.

A Regional Advisor for Prevention of Blindness is established in the WHO Regional Office for South-East Asia in New Delhi. This full-time position is co-funded by the Royal Commonwealth Society for the Blind and the Asian Foundation for the Blind.

Seva Service Society is founded in Canada to encourage broader participation by Canadian citizens in Seva's blindness prevention and other activities.

1983 Organisation pour la Prévention de la Cécité (OPC) is founded in France.

1985 The International Eye Foundation becomes the first international eye-care NGO to be accepted into official relations with WHO.

1986 The Consultative Group of NGOs to the WHO Program for the Prevention of Blindness is established to provide a forum for closer consultation among organizations interested in prevention of blindness. Meetings are to take place on years when the Program Advisory Group does not meet. Meetings of the Consultative Group also provide an opportunity for communicating to interested NGOs particular projects or needs in selected countries, where the WHO Program does not have the required resources to intervene, but where NGOs have good working channels. Mr. Alan W. Johns is elected first Chairman of the Group.

The Third General Assembly of the IAPB is held in New Delhi, India. This Assembly is attended by over 400 ophthalmologists, eye-care professionals, public health specialists, managers, and others engaged in the battle against unnecessary blindness. Its theme "A Decade of Progress" coincides with the completion of 10 years of IAPB service. Participants discuss possible means of strengthening national blindness prevention committees and ways of improving communication and cooperation among national committees and NGOs. Four workshops are held and four symposia examine the operation and delivery of eye-care services, communication for eye-health care, the magnitude of blindness, and community ophthalmology. A course in research methodology in public health and clinical ophthalmology is presented. Dr. Kupfer is re-elected President.

Helen Keller International announces a global attack on cataracts.

1987 WHO Task Force completes a second comprehensive compilation and analysis of blindness data, and estimates that there are between 27 and 35 million blind people in the world.

1989 IAPB hosts a four-day series of conferences in Bethesda, Maryland, at which 70 people from more than 20 countries participate. IAPB commemorates the tenth anniversary of the WHO Prevention of Blindness Program and with major NGOs holds a symposium on the control of cataract blindness. These meetings provide the participants an opportunity to discuss accomplishments in the prevention of blindness field and to examine the delivery of eye care relevant to the alleviation of cataract blindness. They also present a valuable opportunity to discuss program and organizational issues and enable a rich exchange of ideas on a variety of topics, including program strategies, training and educational modalities, evaluation methodologies, cost-recovery mechanisms for eye-care programs, and applications of appropriate technologies.

1990 The Fourth General Assembly of the IAPB is held in Nairobi, Kenya, and is attended by more than 400 ophthalmologists, public health workers, and managers. National prevention of

blindness committees from 60 countries are represented by 113 people at the Business Meeting. The theme "Sustainable Strategies—Agenda for the 1990s" is discussed at six plenary sessions and four workshops by 86 designated speakers and panelists, plus scores of active participants. The contingent from Francophone Africa is provided with simultaneous translation at all plenary sessions, and several workshops are held in French. During the five-day meeting, the following subjects are discussed at the plenary sessions: national programs in Africa, regional progress reports, sustainable manpower development for blindness prevention, new developments in the control of major causes of blindness, and sustainable national program development. The workshop topics include: manpower development, delivery of specific eye-care services, major challenges and priorities for the delivery of eye-care services, and essential characteristics of a model self-sustaining prevention of blindness program, including partners such as private industry, NGOs, and WHO. Mr. Alan W. Johns (United Kingdom) is elected President.

Christoffel-Blindenmission and Sight Savers co-fund a landmark WHO meeting in London on childhood blindness.

1991 A Regional Advisor for Prevention of Blindness is established in the WHO Regional Office for the Americas. Co-funding for this post is provided by Sight Savers and Organización Nacional de Ciegos de España. Similarly, the WHO Prevention of Blindness headquarters staff are strengthened by a post supported by the International Association of Lions Clubs.

Ongoing evaluation of the very successful vector control scheme of the Onchocerciasis Control Program, which has been applied over more than 1 million square kilometers. The disease and its eye complications are now about to disappear in the program area. In addition, several IAPB member organizations are increasingly involved in Ivermectin distribution programs in the extension program areas.

A meeting on strategies for Ivermectin distribution through primary health-care systems is held at WHO headquarters in

Geneva, with support from the Consultative Group of NGOs to the WHO Program for the Prevention of Blindness.

The Second Leeds Castle International Conference on the Prevention of Disability proposes an agenda of action against avoidable disability using the Prevention of Blindness program as its model.

If you wish to comment upon or make suggestions to these brief "milestones," please write to Terrence Gillen, National Eye Institute, National Institutes of Health, Bldg. 31, Rm. 6A-17, Bethesda, Maryland 20892, USA.

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